

THE IRON AGE

Established 1855

New York, April 29, 1915

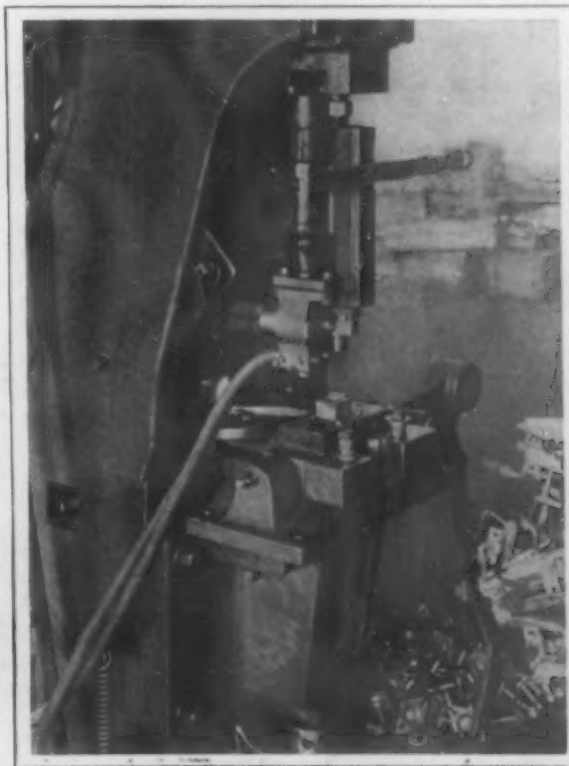
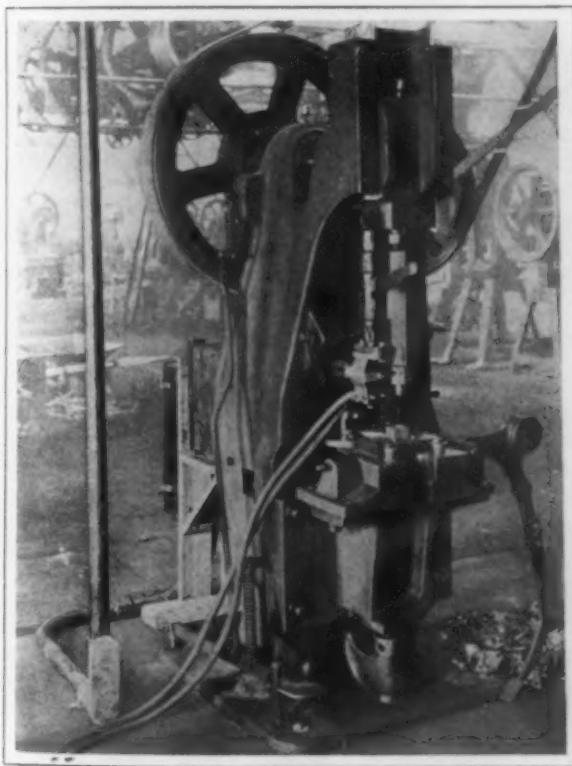
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A Machine Which Heats and Drives Rivets

Heating Electrodes Combined with the
Rivet Driving Punch on a Swinging
Arm—Forging Another Application

Frank P. Kobert of the Barnes & Kobert Mfg. Company, Milldale, Conn., has invented and patented a new type of electrical riveting and forging machine, which has demonstrated its usefulness and efficiency in commercial operation at the company's plant. The fundamental principle of the invention is the movable head which carries both the

The movement of a pivoted arm brings the punch over the work. The punch descends on tripping the press in the usual manner, and forms or upsets the head on the rivet. There is no appreciable wear on the punch, which may be cut to imprint a trademark or other impression on the rivet heads, if desired. The usefulness of the machine



General View of a Recently Developed Electric Riveting Machine in Which the Electrode for Heating the Rivet Is Combined with the Punch for Driving It on a Swinging Arm with a View at the Right Showing the Swinging Arm, the Electrode and the Punch in Greater Detail

electrode and the punch. The control of the current is a simple matter; the electrical pressure is very low, from 2 to 4 volts being used. The amperage is high.

The rivet is heated by a not highly skilled operative to within close approximation of the desired temperature, between 1500 and 1800 deg. F. No danger of electrical shock, it is emphasized, exists, so low is the voltage. The machine does its work very rapidly under commercial conditions, only 5 sec. being required to bring a $\frac{3}{8}$ -in. rivet to a forging heat.

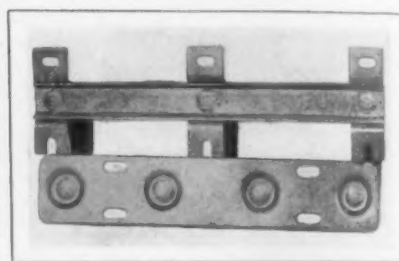
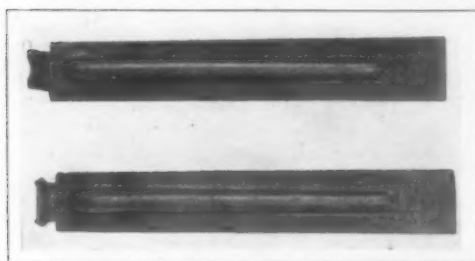
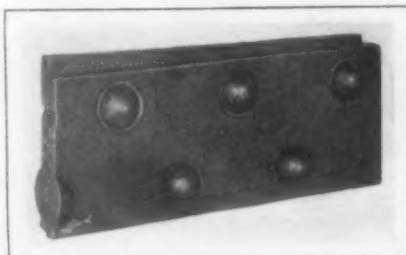
is by no means confined to riveting—it may be used with equal success in forging metal.

The housings of the machine are those of a specially designed punch press. The upper electrode with its copper contact point and the punch are both mounted on a heavy movable arm, which is a part of the ram. The swing to the right or to the left is regulated by adjustable stops, located on the frame of the machine. The table carries the lower electrode and the die-bed which, with the dies themselves, is opened and closed by the action of the treadle at the right. The transformer is mounted

in the rear, and has five positions for control of the current. Eight leads are used to give a large mass of copper and at the same time permit of flexibility in the cables making the connection with the swinging arm.

As has been stated, the voltage is low, but the quantity of current is high. Under this arrangement the tendency toward heating is small, and is further reduced, practically to nothing, by a system of water cooling. One can lay his hand on the mass of copper of the electrode head without discomfort.

The cycle of operation follows: The dies being open, the operator introduces the parts to be riveted and the rivet, and closes the dies. The head is swung to the right up against a stop, which brings the electrode point into exact position over the end of the shank of the rivet.



Examples of Work Done by the Machine—From Left to Right These Are a Forging, an Upset Eye and Some Studs or Extensions on a Bracket, While Above Are Shown Some $\frac{3}{8}$ -In. Rivets That Have been Upset by the Machine

The handle causes the contact which is maintained until the desired heat is obtained. The lever is elevated and the head is swung to the left against the other stop when the punch is correctly located in relation to the work. The action of the left treadle causes the machine to act as a press and the rivet head is formed. In the heating position the ram cannot descend, being positively locked for safety. It is claimed that the metal in the riveting process is so clean that small chance exists for the corrosion leakage and gas passages, which sometimes occur where rivets are heated in forges. The action of the punch following without appreciable delay the attainment of the correct heat is to fill the rivet hole completely with clean metal. The intention is to develop the riveting machine for such work as the fabrication of structural steel and the building of boilers. All that would be required in such a design is a machine having jaws of the proper depth, perhaps substituting a trip hammer for a punch. The work would be fed to the machine on suitable vehicles.

The machine is furnished in four sizes, having capacities respectively for $\frac{1}{4}$ -in. rivets and smaller, $\frac{1}{2}$ -in. and smaller, $\frac{3}{8}$ -in. and smaller and above this limit to 2 in.

In writing about Russia and her trade a writer in the Engineer, of London, says that no doubt in Russia indigenous names will supersede the German, and we shall see blossoming forth Kuznetzovs, Melnikovs and Shoulskis in place of the Schmidts, the Muellers and Schultzes of yore. The writer holds that it will be hard to oust the industrial, commercial and technical influence of the tenacious German after the war. He mentions that the majority of people forget that Russia is almost a German state, that the Baltic provinces, for instance, are entirely German in speech, thought and sentiment. Nearly all of the shop keepers in Petrograd and Moscow have German names.

Record of an English Blast Furnace

The performance of an English blast furnace in a campaign of 38 years is commented on by Alfred O. Cochrane in the Proceedings of the Cleveland Institution of Engineers (England), under the title of "Note on No. 2 Ormesby Blast Furnace." Its dimensions were: Hight, 90 ft.; bosh, 28 ft.; hearth, 8 ft.; diameter at nose of tuyeres, 6 ft.; in June, 1880, 7 ft. 4 in.; and in 1890, 10 ft. The furnace was blown in in May, 1876, and blown out on May 30, 1914, having produced 1,365,349 tons 6 cwt. of pig iron. From 1877 to 1881 the average output per year was 23,091 tons, with a blast pressure at the plug hole of 3.84 lb., a consumption of coke per ton of pig iron of 20.43 cwt. and a charge of iron ore of 66.21 cwt. In 1913 the average output per year was 41,719 tons with a blast pressure at the plug hole of 5.55 lb. and a consumption of coke per ton of pig iron of 21.60 cwt. and an iron ore charge

of 66.46 cwt. There were two salamanders, an upper and lower, separated by a layer of kish. They analyzed as follows:

| | Upper salamander | | Lower salamander, |
|-----------------------|-------------------|-----------------|-------------------|
| | Center, per cent. | Side, per cent. | Center, per cent. |
| Iron | 81.12 | 85.48 | 94.45 |
| Manganese | 8.28 | 2.02 | 0.14 |
| Graphite | 3.45 | 7.50 | 2.70 |
| Combined carbon | 1.00 | 1.07 | 0.72 |
| Silicon | 1.13 | 1.88 | 1.38 |
| Sulphur | 4.60 | 1.07 | 0.09 |
| Phosphorus | 0.42 | 0.99 | 0.51 |

The relatively small quantity of phosphorus in the center of each salamander is pointed out as a remarkable feature. Dr. Stead, after a metallographic examination of specimens of the salamanders, said: "The chief point of interest is that the one half per cent. of phosphorus is completely diffused in the matrix in solid solution together with the silicon, the reason being a very long heating at temperatures below 943 deg. C. I had previously met with decarbonized portions of a furnace salamander from the Ferryhill furnaces which contained nearly 2 per cent. of phosphorus in solid solution, but this is the first time I have met with cast iron containing all its carbon and silicon and as much as 0.5 per cent. of phosphorus in that dissolved condition. Pearlite was variable in different parts and quite absent in some portions."

An increase in the tariff on importations into Russia of 30 per cent. is announced in newspaper dispatches. According to Inspector of Finance Bark, the tariff is a temporary one to make up in part for the loss in revenue from the stoppage of the vodka traffic. Mr. Bark is credited with saying that Russia looks for a tremendous increase in her trade with the United States and her allies. Other ways of making up for the loss of the vodka revenue, in all about \$450,000,000, include a special war tax on railroad transportation, and on matches, sugar and other ordinary commodities.

All-steel cars are being adopted on Egyptian state railroads, the first consignment of the 30 ordered having been received from Leeds, England.

A Special Type of Slag Handling Crane

A special type of traveling crane designed for breaking and handling slag and putting it into shape for commercial use and loading it on cars was recently built by the Toledo Bridge & Crane Company, Toledo, Ohio, and erected at the plant of the Punxsutawney Furnace Company, Punxsutawney, Pa. The trolley of this crane is of a special design that includes complete auxiliary hoisting mechanism with bottom block, which is used in laying chains in the slag beds of blast furnaces and also for pulling the chains in breaking the slag. In addition to this slag chain hoisting mechanism there is built into the trolley a complete bucket operating mechanism. There is one drum for the operation of the opening and closing line and two drums for the operation of the holding lines on the bucket, the hoisting mechanism for the opening and closing line and the holding lines being duplicate and operating independently by their own motors.

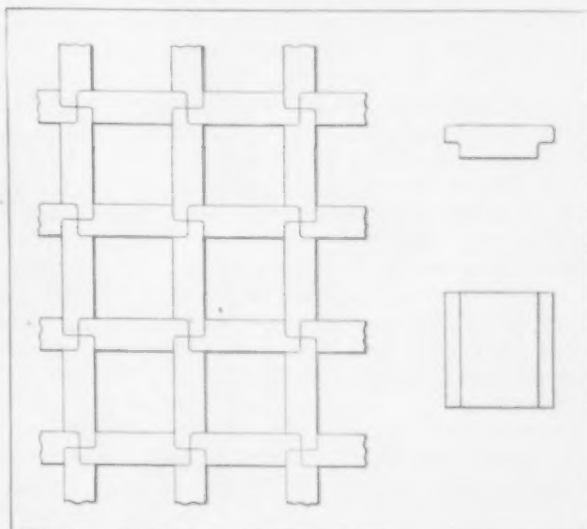
There are four 30-hp. motors on the trolley and a 5-ton motor on the bridge. All of the motors are of the General Electric mill type. The two motors operating the bucket mechanism are equipped with dynamic braking controllers. The trolley motor, the hoisting mechanism for the slag chains and the bridge traveling motor are provided with standard controllers.

The trolley, with the exception of the drum and bearings, is of steel construction throughout and is of very heavy construction to withstand the load placed on it when breaking the slag. The girders are practically of the same design and construction as in any standard traveling crane, being of the riveted box-section type with structural trucks equipped with rolled steel wheels and bearings of the M. C. B. oil waste type.

The span of the crane is 75 ft. and the length of the runway is approximately 150 ft. It is equipped with 1½-yd. Hayward bucket with manganese steel teeth. The maximum lift is approximately 30 ft. The crane can be furnished in either the standard traveling or gantry type with cantilever extensions, should they be desired.

Interlocking Brick for Hot Stoves

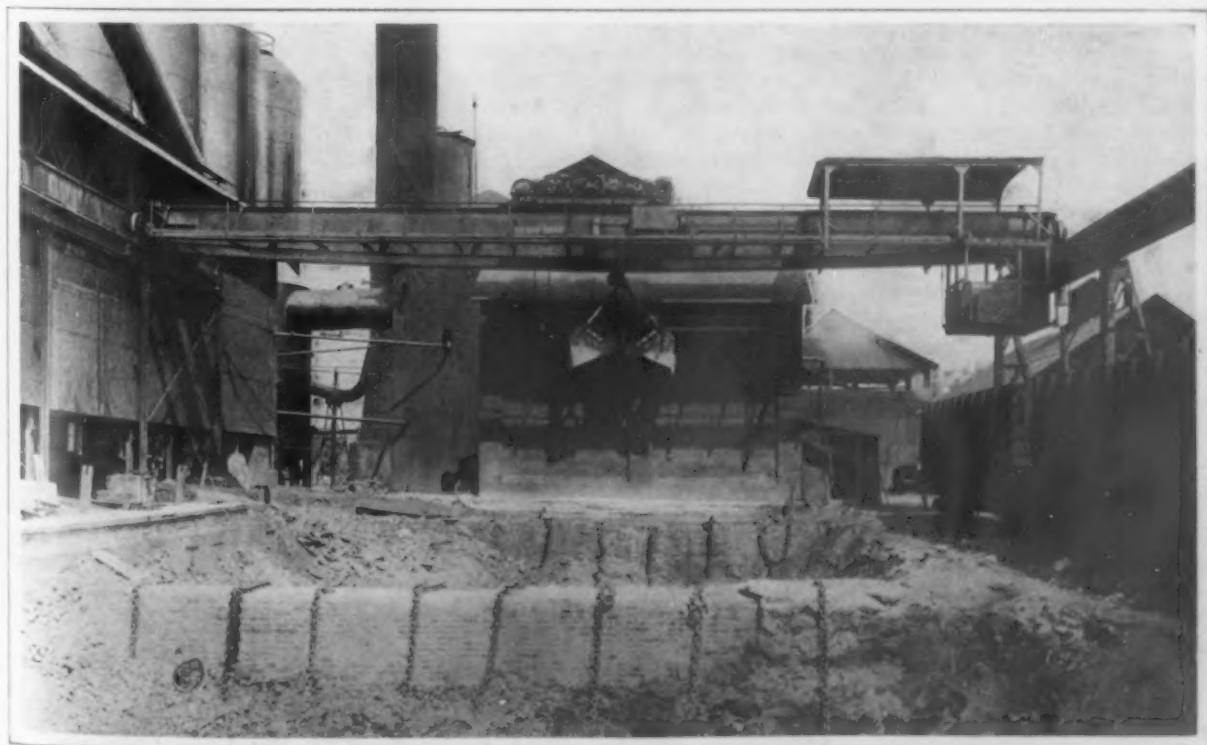
The illustration shows a form of interlocking brick for hot-blast stoves which has been patented by Edwin E. Slick of Johnstown, Pa. The patent (U. S. 1,130,031—March 2, 1915) covers a brick which will withstand the extreme changes of temperature to which the



A Top Plan View of the New Interlocking Brick for Hot-Blast Stoves. At the right a brick is shown in plan and side elevation.

bricks of the checker work are alternately subjected, causing a contraction and expansion and the sudden explosions and blasts, both resulting in a shifting of the alignment and a reduction of the stove's efficiency. The boundary edges of the brick are so shaped that they will not be shifted from their original position. They are so constructed that the regenerator flues will be in a true alignment, so that cleaning apparatus can be inserted easily. The illustration shows a top plan view of a section of the interlocking brick work, the brick being in plan and side elevation at one side.

The M. W. Kellogg Company, whose specialties are power-plant piping and radial brick chimneys, will move its office May 1 from 50 Church street to 90 West street, New York.



A Special Traveling Crane Equipped with Auxiliary Hoisting Mechanism and Bottom Block for Laying the Chains Shown in the Foreground in the Slag Bed and Pulling Them To Break the Slag for Commercial Use and a 1½-Yd. Bucket for Loading the Slag on Cars

French Steel Plants in War Time

Whole Industry Enduring the Worst Blow in Its History—Many Works Operating Profitably—Plants in German Hands—Large Demand for Foreign Steel

BY FRANCIS MILTOUN

The iron industry of France began only just previous to the Revolution scarcely a century and a quarter ago, starting as a side issue to agriculture, long after the textile industry had in a small way already become an established trade. In the eastern provinces, those next the German border, the old time smelting furnace was lighted when the crops had been gotten in and only extinguished with the planting of the next crop; thus the peasants, metayers and proprietors of these departments lying between Paris and the Rhine had a source of productiveness throughout the year which many other regions lacked. It was from this that the great established iron and steel industries of France grew up, today largely localized as then in the regions to the east of Paris through which the invaders from over the Rhine marched in 1914 as they did 40 years before.

The iron industry of France is centered chiefly in seven departments of the north, east and mid-sections of the country, but two departments, Meurthe et Moselle and the Nord, both of them today enveloped by the forces of the German armies, produce between them quite three quarters of the entire supply of the country. Meurthe et Moselle alone, of the old Province of Lorraine, furnishes today double the quantity of the other six producing departments. In this department is located one of the chief steel plants of France, the Usine de Joëuf, but ten steps from the German frontier, a part of the property, which was in full prosperity long before the Franco-Prussian war of '71, having become German as a result of the Treaty of Frankfurt. Outside of the Lorraine output, the Departments of the Saone et Loire and the Pas de Calais contribute two-thirds of the remainder of the home product. The ore used in the furnaces of French Flanders and Basse Bourgogne is, however, largely brought into these regions from other producing districts—the Alps or the Pyrenees, Spain, Elba, and above all, from France's own North African possession of Algeria, where the celebrated Maktael-Hadid is the veritable "mountain of iron" which its name indicates.

The development of the steel industry of France is due to Schneider, the founder of the great works at La Creusot, who procured from Tasquin, a Belgian, the French rights in the English invention for producing basic steel. The chief of the Creusot company bought the rights for use in his own plant for 25,000 francs, but was constrained ultimately to pay 800,000 francs for working a process, the ownership of which was in doubt.

PLANTS IN THE ENEMY'S HAND.

Any consideration of the metallurgical industries of France comprehends in the first instance grouping the elements geographically. The first region is that of the East and North, districts which are almost entirely in the hands of the invading German armies at this writing. As a result of the seven months' battering they have received, these districts, individually and collectively, have suffered more than those of any other section where, if not an intensive, at least a modified activity has been

steadily carried on. In the first rank are the famous Acieries de Longwy, one of the first fortified French towns to fall before the 42-cm. Krupp guns which Germany, without so much as asking, prevented the Westphalian ironmaster from delivering to the clients for whom he had made them; the Acieries de Micheville, the Forges du Nord et de l'Est and the Forges de Denain-Anzin in the midst of one of the most prolific French coalfields. These four establishments are situated in the zone actually occupied by the invading army since August last. Here there is no possible question but that the economic value of these plants has been swept away and, so far as their value to France is concerned, it is as if they had never existed. They may perhaps retain this status for years or forever should the territory come definitely to be acquired by the enemy by conquest. In the latter case never will their product find a market in France, for France will never willingly be a purchaser of commodities which are considered necessities, even from Germany. The question of the *droits de gens* with respect to the future of these properties is one quite apart from the present discussion—a French enterprise on German soil being as undreamed of a project as a revival of the German hotel industry on the French Riviera, which in recent years had attained figures exceeding 50 per cent. of the total.

Provided that these invaded regions ultimately revert to France it is indisputable that the set-back which the metallurgical industry will have received there will be insurmountable for many years, aggravated to some extent by the depredation which the plants have doubtless been subjected to and the practical impossibility of starting them up in full force anew. Furthermore, with regard to all these properties there is not the slightest available information to hand which would indicate the exact fate which has befallen them, though it is a reasonable hazard to state that they are doubtless being worked for the enemy's benefit. When one considers that the prime cost of an iron or steel plant in its most modern phase is figured in tens of millions of francs and its life in but comparatively a few years it is obvious that it must be worked continuously and to the limit in order to show a balance on the right side of the profit and loss account. In default of having made a profit for its original owners it might conceivably happen, for one reason or another, that it might have to be scrapped and built up anew at practically a duplication of its first cost, a cruel blow which, if inflicted on any one of a dozen known organizations in the danger zone, might prove one from which recovery was impossible.

PLANTS IN MID-FRANCE

Another prominent producing region is that of mid-France, of which that neighboring upon the headwaters of the Allier is the chief. The Forges de Messarge, in the Department of the Allier, produced 150 tons of iron in 1794 with the labor of 500 men. This was one of the first established iron plants of which there is a record in France.

Certain of the plants in mid-France have affiliations with those of other regions and since they have not been attacked, nor likely to be, they have helped save the situation for the combined interests and will accordingly weather the storm. Others in the stricken districts, which may not be so favorably situated and with small financial resources, may not. In the first class are such affiliated organizations as Chatillon-Commentry and the Acieries de la Marine. These two, though they have sorely suffered, have been able to repair in no small way the deficiencies of their balance sheets by a doubled intensity of effort and output in their plants situated in mid-France. But they have felt the temporary results of the blow which in the first days of the mobilization robbed them of a large part of their labor. Today each has taken on a semblance of its former capacities and earning power. Each is, and has been, a large army and navy government contractor and practically their entire outputs are commandeered at this time to that end, thus making a void in the supply of raw and semi-manufactured product which would ordinarily find its outlet in private demands, even with other concerns working to government order in supplying them with their provision of raw material usually drawn from these fountain heads.

Referring again to the Lorraine frontier it is learned that what is known as the Bassin Minier de Briey and the district around Villerupt has been invaded since early August and since the German army has kept its advances well up towards Paris all along there has been no destroying bombardment by either side here and for that reason none of the attendant depredations of war have taken place within many miles. There are large combined French and German capital interests throughout this region, and obviously it has been the German interests which have been protected during these seven months of war. The French military scheme from the first did not moreover comprehend any active campaign here which was immediately given to the invaders as a bait. East of a line drawn from Conflans-Jarney to Audun le Roman and Longuyon no combat has taken place.

THE BLAST FURNACES AND MINES STILL INTACT

German interests have for a long time extracted mineral in this region and it is probable that they look to it to one day come definitely into their possession for all time. Their first care then was not to destroy but to conserve its resources, not to tear down but to build up. It is reported that the Germans have made Professor von Kohlmann director of the school of mines at Thionville in Alsace, mining commissioner of all the invaded region of Lorraine with headquarters at Villerupt.

The Hauts Fourneaux de Micheville are reported intact and those of Joeuf and Homecourt (Acieries de la Marine) have been placed under sequestration by the German authorities in power, so that the resources may be conserved pending the ultimate outcome of the war. The Aubrives-Villerupt plants are also unscathed. Of the mining properties themselves producing iron ore those of the neighborhood of Saint Pierre mont and Mouriere are still working, though under a reduced pressure, the coal mines of La Houve furnishing them electric current. The Acieries de Longwy are reported safe and the Mines de Tucquegnieux which are their property are equally unaffected, as are those of Vallery, the latter belonging to German interests exclusively.

Brief though this specific comment is it affords an encouraging outlook for the present and the future in this sorely distressed region. If a precipi-

tate retreat takes place it is probable that conditions will change in a twinkling, for it is not likely that the German army will leave any warlike staffs on which the French army may lean as it comes up behind. If peace terms are brought about before evacuation there is perhaps an even chance that these properties will remain untouched. Their status is, however, bound to be discounted.

DEMAND FOR FOREIGN SUPPLIES

It is such conditions as the paralyzing of home sources of supply to a large extent and the curtailment of the efficiencies of others which has brought about a demand for certain supplies which has already made itself felt in the United States, and certainly so far as private industry is concerned, there is a demand for raw and semi-finished material vastly in excess of what there ever was before. The demand, too, will be greater before it is less.

The Acieries de France have their principal plant at Isbergues in the Pas de Calais and up to the present, though the fringe of this department has suffered cruelly from the invasion, the effect has not been so far reaching as to have actually affected it, though the general mobilization of reserves and territorials, and the actual proximity of the fighting line has considerably discounted normal working conditions. In addition these works were at the outbreak of the war undergoing a complete transformation, leading to their ultimate increased efficiency, and thus this effort has for the time being gone by the board and such product as is being turned out has been achieved under appreciably hard conditions for six months past.

Commentry-Fourchambault is today in a quasi-privileged situation inasmuch as its metallurgical plant in mid-France is working to the full in such lines as the times and circumstances permit, besides which its coal deposits are being roughly worked to supply in a measure a coal shortage which has been brought about by the closed mines of the invaded districts of the north. In normal times the profits of this organization are produced about equally by its steel plant and its coal exploitation, but it is probable that under the present regime the latter is producing by far the largest proportion. This company is, nevertheless, paying a tribute to Germany by reason of the losses which it has undergone at Pont à Vendin, just to the north of Arras in the Pas de Calais, where it possesses a considerable interest in a steel plant situated in the very volcano crater of fire and flashing steel and bursting bombs. This Pont-à-Vendin enterprise has not, however, any participation in the profits of the parent organization, so it acquires a sort of half agreeable sensation out of the fact that nothing which has taken place has put any direct tax on its activities in the center of France.

THE GREAT CREUSOT PLANT

The most important of the units of the metallurgical industry of France is unquestionably that of the Creusot plant, which, it appears, is in altogether an exceptionally favorable situation as much by reason of being one of the main pivots in the national defense as by the magnitude of its operations. For years the company has been by far the largest producer of common iron and steel in France and in the actual existing circumstances has suffered little diminution in its finished output. It is one of the world's chief manufacturers of artillery for the armies of the world and its plant shows evidence today as always of a super-activity

which has no parallel within the borders of France. On land and sea there is a prodigious expenditure of ammunition and it may be said that when a nation goes to war the whole of her metal industry must go to her support. It is along these lines that the Creusot works is playing its great part, and this in spite of a general disorganization of labor as a result of compulsory military service.

The Hauts Fourneaux de Caen, in which the Prussian firm of Thyssen was largely interested, has of course undergone a reorganization, and since their complete installation has not been achieved since the outbreak of the war, it is working under a considerable handicap, not only from this cause but also from the scarcity of labor. The ore which it controls and which it cannot itself use at present can now be offered to other establishments and these newly exploited deposits of Normandy are now proved to be considerable. The annulment of the German contract has freed large quantities for general use.

Other big French companies, more particularly devoting themselves to metal transformation, are the Société Française de Métaux, the Tréfileries du Havre and the Electro-Metallurgie de Dives. Of these one only has undergone any direct damage; the first named, whose plant was at Givet, on the Belgian border, on a little tongue of territory almost an enclave, was speedily surrounded by the invading armies and since has not for a moment had access to the outside world. Fortunately the company operates four other plants which have in no way suffered. All three of these companies are working full on orders for semi-finished metal and parts for government account.

THE GENERAL SITUATION

In résumé, the war may not be said to have affected the iron industry as seriously as might have been supposed. Indeed, certain privileged plants, as has been shown, are working under exceedingly profitable conditions, and will go further in this direction as soon as production can be increased. It is not possible to compile rows of figures for comparison with those of a former period, for many of the operations on behalf of the government are shrouded in secrecy. It is probable that the industry as a whole has suffered the worst blow of its career and some palpable losses from which recovery will be difficult if even possible in some instances. But it is also true of those plants which have not been affected that there is an undercurrent of quasi-prosperity which should prove a great stimulus to recovery throughout the industry. Since the concerns which are working with the production of ore, of semi-finished and of finished material cannot completely fill the demands made upon them, and since there is little likelihood of their meeting any outside competition, except that American plants may be able to break in in a veritable invasion, their profitable operation seems assured for some time to come.

What the ironmasters of France are looking forward to is a great development in the Lorraine basin, now largely "aggrandized," which is the Frenchman's naive way of saying simply that he hopes ultimately to recover by conquest all the iron-producing region which was lifted from him 40 odd years ago.

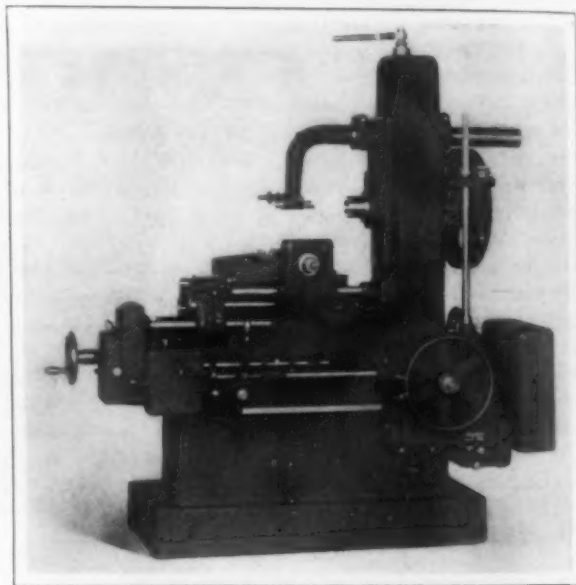
The New York office of the Nordberg Mfg. Company, Milwaukee, Wis., builder of engines of various types, air compressors, electric hoists, etc., has been moved from 42 Broadway to the new Equitable Building, 120 Broadway. M. N. MacLaren is in charge.

Automatic Spur and Bevel Gear Machine

The E. J. Flather Mfg. Company, Nashua, N. H., has brought out an automatic machine for cutting spur and bevel gears. This machine, which is designated by the builder as its No. 2 size, will cut gears up to a maximum diameter of 24 in., the maximum face width being 8 in. When an overhanging arm is used, the maximum diameter of gear that can be handled is 17 in., and larger gears than these are taken care of by an adjustable rim support.

The cutter, which is mounted on an arbor $\frac{7}{8}$ in. in diameter ordinarily, can be adjusted sidewise for machining bevel gears. The cutter is returned at a rapid constant speed, the rate of return being entirely independent of the speed or feed of the cutter. Change gears provide for 8 different rates of speed and 12 feed changes. The cutter arbor has an outer bearing and, if desired, can be removed and sizes other than the $\frac{7}{8}$ -in. one substituted. The cutter carriage can be adjusted to any angle up to a maximum of 90 deg., the angle of elevation being indicated by a series of graduations.

The work spindle has a No. 12 Brown & Sharpe



A New Automatic Gear Cutting Machine That Has Been Developed for Producing Spur and Bevel Gears Up to a Maximum Diameter of 24 In.

taper hole at the front end and is fitted to receive either a face plate or a fixture. A hole 1 in. in diameter extends through the spindle for its entire length. The screw controlling the elevation of the work spindle head is mounted on ball bearings and is operated by a handwheel. The dial indicating the movement of the head is graduated to 0.001 in.

The indexing mechanism operates at a constant speed. By the use of change gears all numbers of teeth from 12 to 100 and from 100 to 400, except prime numbers and their multiples, can be cut.

The equipment furnished with the machine includes a cutter centering indicator, tables, change gears, the necessary wrenches, a countershaft and an oil pump and fittings. The weight of the machine, including the standard equipment, is approximately 2500 lb.

Henry Potts & Co., iron and steel merchants, Real Estate Trust Building, Philadelphia, Pa., who have purchased the equipment of the Bellefonte Furnace Company, Bellefonte, Pa., together with that of the Scotia and Red Bank ore mines in that vicinity, are dismantling the properties and selling the machinery, all of which is in good condition. The furnace, when in operation, used coke as fuel.

A Fixed-Throw Crank Grinding Machine

A fixed-throw crank grinding machine, the heads of which are designed for the rapid handling of crankshafts when grinding pins, has been placed on the market by the Landis Tool Company, Waynesboro, Pa. Among the special features of the machine are the elimination of any necessity for indexing the heads or taking the crank out of the machine before it is finished and the ability to use the grinding wheel to a smaller diameter than was formerly the case.

In operating the machine the cranks are fixed in position by a locating pin which enters the hole in the flange of the crank. These holes, which were drilled centrally with the pins, are finally used when clamping the flywheel to the crankshaft. Both single and double throw cranks can be accommodated by the heads, which are particularly adapted for cranks having a flange.

The throw on the machine can be changed by using other crank carrying fixtures which can be furnished to handle double-throw cranks up to 6 in. and single-throw cranks up to 8 in. When the former are being machined, it is pointed out that the only changes necessary are the loosening of the clamping bolts in the crank carrying fixtures and the turning of the crank around to grind the other throws.

The design of the heads permits the wheel to be worn down to a smaller diameter than is usually the case. It is pointed out, however, that it is not possible to use the wheel entirely up when grinding pins, but it can be worn down to a much smaller diameter grinding line bearings.

Indicator for Testing the Lead of Taps

The Remington Tool & Machine Company, Boston, Mass., has placed on the market a lead indicator. This is a development of the line of special screw lead indicators which have been made in the past for firms maintaining close screw standards. It is designed for measuring the longitudinal pitch or lead of taps.

As will be noticed from the accompanying engraving, the device consists of a block for holding

the parts to be gauged, two hardened steel points spaced at a definite interval, an arm for multiplying the indication of the steel points and a scale for indicating the amount of deviation from the standard. The steel points used are cut at an angle of

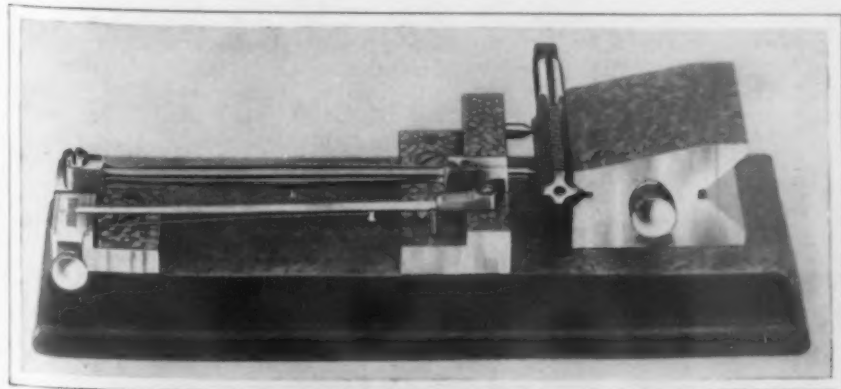


A Fixed-Throw Crank Grinding Machine in Which the Heads Are Designed for the Rapid Handling of Crankshafts When Pins Are Being Ground and the Throw of the Machine Can Be Changed if Desired

60 deg., to enter the threads readily and are spaced either $\frac{1}{2}$ or 1 in. apart. The plugs are placed in the thread of the tap, as shown, and any variation from the standard spacing is indicated by the moving of the pivoted arm which extends back to a point adjacent to the scale. This arm bears against the multiplying lever alongside of it, and the variation from the standard is indicated by the pointer passing over the scale at the left. The screw holding block is milled to hold both large and small diameter pieces.

A New Carburizing Agent

An invention which depends on the discovery of a carburizing agent which the inventor, Samuel S. Eveland, of Bryn Mawr, Pa., in his patent (U. S. 1,133,626—March 30, 1915) claims is more efficient in yielding up its carbon to metals and in causing it to penetrate than substances heretofore used, is applicable, not only to the ordinary case-hardening process, but also to cementation processes where large masses or plates of metal are carburized. The material specified is a vegetable substance containing a sufficient amount of carbon and a nitrogenous constituent. The pulpy matter that remains after the sugar has been extracted from the beet is abundant and consists of a fibrous mass which contains, in addition to carbohydrates, over 5 per cent. of protein, a nitrogenous substance. The inventor employs this material, dried or more or less charred, in the usual way and finds that the carburization is more uniform and of greater depth than that usually secured. It is believed that the nitrogenous compounds effect a more easy and uniform penetration by the carbon.



An Indicator for Measuring the Lead of Screws and Taps

Swedish state railroads are reported to have recently contracted for 200,000 tons of German coal briquettes and 72,000 tons of German coke. A mixture of the two is to be used as a locomotive fuel on some lines. The price is considerably less than that of British coal.

Book Reviews

Engineering Office Systems and Methods. By John P. Davies. Pages 544, 6 x 9 1/4 in.; illustrations, 244. Published by McGraw-Hill Book Company, Inc., New York. Price \$5.

The engineers and draftsmen of an iron works doing contracting and erecting of such structures as docks, railroads, power houses, etc., in foreign lands are in a position where omissions and mistakes are likely to be serious, to say the least. There was not long ago a cartoon in an engineering magazine, labeled "The Successful Bidder." The picture showed the engineer sitting at his desk reading a letter of acceptance and saying to himself "What did I forget?" The author in his engineering experience has made a collection of notes covering not only the various propositions that came to him but extracts from engineering magazines and catalogues containing points on engineering office matters.

Starting with the preliminary investigation of special engineering projects, such as sugar mills, power houses, water works, piers and bridges, the book outlines the methods that may be used and points that are not to be forgotten in preparing the design and making up the estimate. The sections on foundations and soil testing outline with illustrations the various methods that can be followed under varying conditions. The book supplies sets of reminders on typical projects; and matters of transportation have not been overlooked. It will often be necessary to have a clearance diagram of the heaviest and largest pieces for transport over a railroad line. Similarly dock and pier or wharf work necessitates information concerning the character of the sea-bed and class of vessels that will lie alongside the wharf, also the government regulations that must be complied with. The outline for preliminary data on the sugar cane factory is suggestive for similar schedules for other industrial plants.

When the proposition enters the designing room, it is looked at from the standpoint of the man on the board; and there are sets of reminders that can be consulted either before or after the completion of the design, to make sure that there were no serious omissions or errors. Here there are outlines for design of such items as a steel-frame office building, machinery foundations, electric traveling cranes and others of various nature which, if they could not be exactly applied, would perhaps suggest similar outlines. The checking of drawings gives considerable space to structural steel matters, and reasons for the failures of some engineering structures. Most young engineers will welcome the aid in writing specifications. It would be very annoying to draw up an elaborate set of specifications for material on a foreign contract and find that one had neglected to specify that the material must be knocked down for ocean shipment.

In purchase office methods and forms, the author has not only outlined a system for engineering offices, but gives samples of forms and letters. Passing through cost keeping with the various methods of time keeping and overhead expenses, we are led into the cost of various items; and from the cost of items into general construction costs and estimates. Here are also found a set of reminders for various engineering estimates.

The office engineer or draftsman, who occasionally is sent out on inspection work, meets conditions unusual to the man on the board; and some of the matter contained in this book on inspecting and testing material has been gathered from various works on that subject, including the sampling and analyzing of materials of construction, as well as shop and field inspections. Both foreign and domestic shipping is reviewed, and typical examples are given of the details, such as bills of lading and freight classifications.

In the progress of engineering work, it is necessary, especially in large offices where many jobs are going forward simultaneously, to maintain progress charts and follow-up systems. Methods are shown here for graphically illustrating the conditions of work and scheduling systems. In fact, a typical scheme is outlined for filing, indexing and recording movements of various classes of data in a small engineering office,

even to details of loose leaf binders and index sheets, with points on cataloguing and filing.

Mainly a reference book for draftsmen and designing engineers, there is a great deal in the book that will not be particularly interesting to the heads of large and well organized offices. To young engineers the book will clear up many points that appear complicated.

Machine Shop Practice. By William J. Kaup. Pages, 199 + xii, 5 x 8 in.; illustrations, 163. Published by John Wiley & Sons, Inc., New York City. Price \$1.25.

The aim of this book, apparently, is to set down in brief form the elementary facts pertaining to shop practice ordinarily acquired by students of a manual training course. The author's desire is to arouse in the student a train of thought leading to a definite conclusion rather than to present a complete or advanced treatise on shop practice.

The book opens with two chapters on vise work, which deal with chipping and filing respectively, and covers also scraping and hand tooling; gives a little on materials of construction and their application, and takes up in some detail the commoner forms of drill presses, planers and shapers, lathes, boring mills and milling machines. The illustrations should prove of value to the student.

Some idea as to the tools used on these machines is given, and in another part of the book, chapters describe the simpler types of cutting tools, their construction and their application to different metals.

A chapter on grinding is worthy of note, as it presents a subject ordinarily overlooked in treatises of this type. It is treated in a manner calculated to set the student thinking on a phase of machine shop practice which is claiming much attention in the modern shop.

A concluding chapter, on system, relates to the clerical work in a machine shop and seems somewhat out of place.

The Art of Estimating the Cost of Work. By William B. Ferguson, naval constructor, U.S.N. Pages, 97, 5 1/4 x 8 in. Published by the Engineering Magazine, New York. Price \$1.

In the hope that at some distant day the art of estimating may become a science, the author has contributed this small work as an incomplete discussion on this subject. It is mainly compiled from memoranda which he issued from time to time to various members of the hull estimating and planning staff at U. S. Navy yards and is the result of his experience in preparing and checking estimates on ship repairs and construction, including days work, piece work and premium systems. Methods of showing costs by curves are outlined and the reduction of costs to a unit basis, such as costs per pound, per foot, per yard, per number or per completed group. Rather than guess the cost of driving rivets, he analyzes the case of scattered rivets, points out the piece rate paid the workman per rivet and how much time must be allowed for preparation when the work is not continuous.

The cost of material in estimating presents little difficulty and the writer has rightly dealt with the uncertain quantity or the cost of labor. There are considerable cost data on ship plate work with actual costs on estimating, planning and ordering material, and some points on developing an estimating bureau.

The printing of the book is poor and it will interest few except those of the shipyards and boiler shops. But to these it offers interesting data on their class of work with suggestions for eliminating haphazard methods in estimating.

Installing Efficiency Principles. By C. E. Knoeppel. Pages, 258 + viii, 7 x 10 in.; illustrations, 103. Published by the Engineering Magazine, New York City. Price \$3.

In the past few years much has been written on the subject of efficiency as applied to works management. Much of this writing has been in the abstract only, and it is but recently that books similar to "Installing Efficiency Principles" have appeared wherein a definite

effort is made to treat the broad subject of efficiency from an applied and practical standpoint.

The author in presenting facts which embrace subjects as diversified as the taking of time study on dipping chocolates and the best manner in which to lay out a steel mill, leads up to them by five introductory chapters. In these chapters is pictured a supposed interview between an efficiency engineer and the board of directors of a moderate sized concern which is rapidly approaching bankruptcy. The author uses this method among other things to bring home to both manager and engineer the broad scope of efficiency work not only by questions to be answered but also by actual facts gleaned from practice.

Having led up to the actual commencement of installing efficiency principles, lengthy chapters follow which discuss respectively: Time-study, the planning department, standardizing the working conditions, and the bonus plan of wage payment. Much data are contained in these chapters, all of which represent the author's applied practice. The chapter on time-study is faulty because it does not develop the final conclusions and application of this kind of work.

The book is concluded by a chapter called the efficiency clearing house, which reviews in detail the results obtainable by the application of efficiency principles, and by a chapter on manufacturing costs wherein the reader is referred to the works of A. Hamilton Church for more exhaustive reading on the subject.

E. C. R.

"Dry Rot in Factory Timbers" is the title of a pamphlet issued by the Associated Factory Mutual Fire Insurance Companies, Milk street, Boston, calling attention to the losses caused by dry rot in structural timbers and suggesting methods of combating this disease. The fact that the "commercial longleaf pine" in the market is composed of a variety of grades of pine, some very susceptible to dry rot fungi, has complicated the problem for factory owners. Where it is impossible for a firm to have its timber selected by a personal representative, it is suggested that the building be thoroughly heated after its completion, moisture and temperature being controlling factors in the life and spread of dry rot fungi. Of the artificial antiseptics in use, soaking timber in a weak solution of corrosive sublimate is most widely indorsed. The Associated Companies are working for standard specifications in the grading of longleaf pine as a means of protection to owners and builders. At present, expensive experiments are being conducted by the Department of Agriculture and the University of Wisconsin to determine causes of fungi and new preservative processes for timber.

Information regarding benzol and coal tar products is given in Technical Paper 89 of the United States Department of the Interior, by Horace C. Porter. It includes a chapter on "Coal Tar Products Used in Explosives." Dyestuffs and carbolic acid are also discussed. Estimates place the output of light oil or benzol in this country at 4,500,000 gal. in 1913. It is stated that the possible annual production, if the recovery process were applied to all the coal made into coke and gas in this country, would be over 100,000,000 gal. New benzol recovery plants now being constructed in connection with by-product coke ovens will add probably 2,000,000 gal. to the annual output.

"Houses for Mining Towns" is the title of Bulletin 87, of the Bureau of Mines, United States Department of the Interior, by Joseph H. White. It concerns improvements that go to shield the miner and his family from unnecessary sickness and discomfort, as found in American mines, the information being based on visits made by the author. It is illustrated by 17 plates and photographs.

"The Smelting of Copper Ores in the Electric Furnace," by Dorsey A. Lyon and Robert M. Keeney, is the title of Bulletin 81 of the Bureau of Mines of the United States Department of the Interior. It is one of a series dealing with the application of the electric furnace to the smelting of ores and the manufacture of alloys.

The authors discuss the possibility of smelting copper ores in the electric furnace, the results of the experimental work of other investigators on the electric smelting of copper, also the results of experiments by the authors on the electric smelting of native copper concentrates and sulphide copper ores, and make a comparison of the electric furnace with the blast furnace and reverberatory furnace for copper smelting.

From the office of Robert H. Patchin, secretary of the National Foreign Trade Council, New York, has come a substantial volume containing the official report of the Second National Foreign Trade Convention held at St. Louis, January 21 and 22, 1915. The papers read at this convention were of unusual value and the proceedings were marked by discussions which brought out more of real importance on the vital phases of this country's export trade than has been produced at any similar gathering. The full report, including all papers and discussions and the list of those in attendance, takes up 284 pages. The book is cloth bound and the pages are 6 x 9 in.

The second volume of "The Seal of Safety," the yearbook of the canning machinery built by the Max Ams Machine Company, Mt. Vernon, N. Y., has been issued. As compared with the first volume appearing approximately one year ago, the number of pages has been increased from 141 to 206. Lists of associations in the canning and packing industries are given, with a number of reference tables covering points of interest to the canner. Some 48 pages of illustrations and descriptive matter are presented, embodying the various types of machines that are built for use in connection with the making of cans.

Shop Progress is the name of a new monthly publication issued by the Cleveland Crane & Engineering Company, Wickliffe, Ohio. For a long time this company has been issuing a house organ called Crane-ing as an aid to its selling department, but the new paper is devoted entirely to its employees, being one of the various means that has been adopted to encourage fellowship, loyalty and efficiency among the workmen. The paper contains interesting contributions by C. C. Robbins, the general manager, other articles of interest and personal and newsy items about employees and happenings in the plant.

A pamphlet prepared under the direction of the Chemists' Committee of the United States Steel Corporation on the sampling and analysis of alloy steels is now being distributed to its various chemical laboratories. This makes the fifth pamphlet so distributed, the purpose of which is to unify and simplify methods of analysis. The first four pamphlets covered the sampling and analysis of iron ores, pig iron, plain steels and gases. To limit requests for copies of these pamphlets a charge of \$1 each is now being made to persons and firms outside the corporation.

The Vulcan Process Company, Inc., Minneapolis, Minn., has issued a third edition of its textbook on oxy-acetylene welding and cutting. The book is designed to give mechanics and autogenous welders short, clear and practical instructions, and the chapters on chemistry, physics and metals are of an elementary nature. It explains the nature and composition of all the metals that are commonly welded, the nature and effect on the metals of all the gases used in autogenous welding and why some welds are successful and others are not.

The Mechanical World Pocket Diary and Year Book for 1915 and the Electrical Pocket Book for 1915, published by Emmott & Co., Ltd., Manchester, England, are at hand. Each is a collection of useful engineering notes, rules, tables and data in their respective fields, one dealing with engineering generally and the other, as its name indicates, with electrical work. They can be secured from the Norman-Remington Company, 308 North Charles street, Baltimore, Md. Price, 50 cents each, postpaid.

RECLAIMING BRASS SWEEPINGS*

A Recovery Process for Foundries, With Equipment Described in Detail

BY A. W. LEMME†

It is to be borne in mind that this problem, so far as our company is concerned, is large and vital. With a melting capacity of about 100,000 lb. of metal per day, using two cars of coke a week, one car of fuel oil every 10 days, and about 80,000 lb. of molding sand per month, our refuse accumulates to the extent of 12,000 to 15,000 lb. a day. In accordance with the occupational disease act, we are not allowed to sweep any floors during working hours. Therefore, it is necessary that we perform this duty at night, and inasmuch as we sweep our foundry and clean the plant, in general, with unskilled labor, we have found that the cheapest way is to dump the refuse in one pile in the back yard and pick out the largest pieces of metal by hand. We then put the rest through a large screen of 1-in. mesh, and that portion of the refuse which goes through the 1-in. mesh is put through a crushing process.

APPARATUS AND PROCESS USED

The crusher we have installed, one purchased from the Thomas Carlin's Sons Company, Pittsburgh, Pa., is run by a 35-hp. motor and is washed by a water process. The two wheels of the crusher are about 4 ft. in diameter with a 10-in. face, weighing about 6000 lb. each, running in a pan 18 in. deep and about 10 ft. in diameter. The crusher is sunk in the floor, the top of the pan being on the floor level, making the feeding of the pan as easy as possible. We feed the pan some 30 min. steadily, then stop the crusher and shovel the heavy brass out of the pan into a jig consisting of a 14-in. square pan with a brass screen of 100 mesh in the bottom. The water agitates through the screen and through the brass. The brass is then shoveled out and the iron picked out by hand. This brass product we term "washings," and it is used directly as a portion of our formulas.

Many fine particles of brass escape with the overflow of water agitating through the jig screen, and this overflow, in conjunction with the overflow from the crusher pan, is led into a pit where a Frenner sand pump automatically conveys this product to an Overstrom concentrating table. The jig, sand pump and table are operated by a 5-hp. motor, belt driven. These processes render four separations of refuse, useable:

1. The large pieces of metal separated by hand.
2. The washings.
3. The pieces that are too large to go through the 1-in. mesh.
4. The concentrate recovered by the Overstrom table.

HOW THE SEPARATIONS ARE USED

The first two separations are used directly in our foundry practice, the third is used in our cupola direct, and the fourth, the concentrate, which runs about 20 per cent. metals, is briquetted by using 90 per cent. concentrate and 10 per cent. of the very cheapest stucco we can buy (about \$5 per ton, carload lots). We form our briquettes by using the above formula, adding enough water to make the mixture a soft mud and shoveling it into forms which set quickly. Two men at 20c. per hour make 300 briquettes per 10-hr. day.

In order to control the efficiency of the concentrating table we take a chemical analysis of our tailings, or the refuse after the concentrate has been separated. We find an average of 0.85 copper, representing 1.10 metal contents, and we analyze these tailings every 24-hr. run. The washings recovered by the above process we find by chemical analysis about 85 per cent. metal as follows: 77 per cent. copper, 12 per cent. lead, 7 per cent. tin and 4 per cent. zinc and impurities. Washings are also analyzed daily.

As I have stated, the third and fourth separations

of the refuse are treated by cupola practice, the one used being a 24-in. water-jacket cupola. Measuring from the bottom to the tuyere holes, there is a straight wall 12 in. high and 24 in. in diameter, the slag hole being 6 in. above the metal hole. The cupola measures 10 ft. from tuyere holes to charging door and increases in diameter from 24 in. to 38 in. at the top. A 4-in. water jacket surrounds the cupola between these points. The only brick lining in the cupola is between the bottom and the tuyere holes. The blast is furnished by a 6-ft. Connellsville positive-pressure blower driven by a 7½-hp. motor. We have experimented with pressure from 8 to 16 oz. and we have found, in melting this low grade material, that pressure from 12 to 14 oz. gives the best results, holding the water in the jacket at about 100 deg. F.

The charges are made as follows: 250 lb. limestone, 380 lb. refuse, 100 lb. slag direct from cupola, 100 lb. coke and 2 buckets of water. The capacity of the cupola is about five of the above charges per hour.

CHARACTERISTICS OF THE SLAG

The slag is tapped three times per hour and is held at a consistency of cream, not allowing it at any time to become sticky, as it is absolutely necessary to keep the slag thin enough for the metal to flow through it freely; otherwise a large portion of the metal would be carried off with it. The slag is tapped into regular slag buggies used by smelters in general and is set aside to solidify before emptying. After being emptied, each ball of slag is broken and inspected for metal, and we often find a good-sized nugget at the bottom. This shows, to our satisfaction, that the slag is thin enough to allow the metal to find its place by gravity.

A sample of the slag is taken by using a small babbitt ladle and pouring a small portion into cold water once every hour, and one analysis is taken on each 12 samples. We have found by this method that the sample is easily pulverized and dissolved. The average analysis is 0.97 copper, 43.50 silicon dioxide and 22.60 metallic iron. We generally make two taps of slag to one tap of metal, bringing down from 8 to 12 ingots weighing about 25 lb. each. One ingot is selected from each hour's run and a complete analysis is taken from the drillings of 12 ingots, thereby taking two complete analyses to each 24-hr. run. The average analysis is 82 per cent. copper, 8 per cent. tin, 7 per cent. lead and 2 per cent. zinc and impurities.

This little cupola has been run as long as 12 days and 13 nights without interruption. Great care must be taken in charging it, as the cupola is small and tapered and is easily hung.

These installations are a combination of ideas gathered through personal experience and the experience of other manufacturing plants which I had visited in the East and Middle West previous to installing machinery in our new plant. For instance, the crusher used is a clay-mixing machine, while the jig, sand pump and concentrating table are mining propositions. Not many brass foundries accumulate such a quantity of refuse, but investigation will not be wasted that leads to an appreciation of the importance of the reclaiming of brass foundry sweepings.

Blower Economy for Air Furnaces

At the plant of the Northwestern Malleable Iron Company, Milwaukee, air for the furnaces was formerly supplied from blowers located at some distance from the furnace which they served, necessitating a considerable length of pipe. For driving these blowers 40 hp. motors were used. Recently individual slow speed blowers have been placed alongside each furnace and 7½ hp. motors, direct connected, have been found of ample size to furnish all the power required.

The determination of chromium and vanadium in steel is dealt with in an article by C. H. Rich and G. C. Whittam in the April issue of Metallurgical and Chemical Engineering. The authors are connected with the laboratory of the Alan Wood Iron & Steel Company, Conshohocken, Pa.

*From a paper presented before the Chicago Foundrymen's Club, April 10.

†With the Chicago Bearing Metal Company, Chicago.

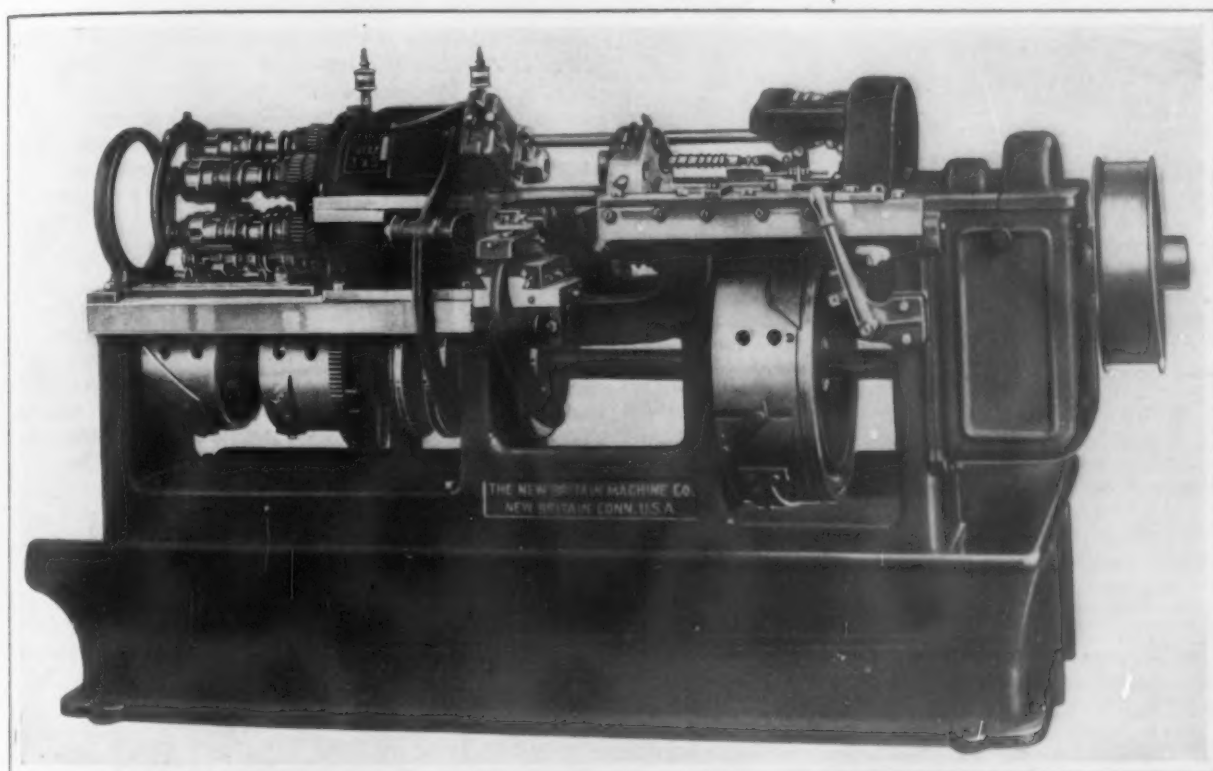
SIX-SPINDLE SCREW MACHINE

Automatic Without Chains and Bevel or Worm Gears—Sloping Bed to Separate Chips

The latest product of the New Britain Machine Company, New Britain, Conn., is a six-spindle automatic screw machine, designed particularly for heavy service. Simplicity of set up and operation were aimed at, and with this object in view, chains and worm and bevel gears have been eliminated. The bed is sloped toward the rear to carry off chips. Another point upon which emphasis is laid is the increased productivity of the machine, due to the heavy design, which is relied upon to enable heavier cuts and coarser feeds to be used. This result is also rendered possible by the use of six spindles, as where work requiring less than the maximum number of operations of which the machine is

bronze bearings which are straight on the inside and tapered on the outside. Provision is made for taking up wear in the bearings without disturbing their alignment. Ball thrust collars take the end thrust due to the pressure of the tools, with the result that the power required to drive the spindles is reduced. Change gears furnish six different rates of spindle speed, while a separate system of change gears is provided for effecting changes in the feed by varying the speed of the camshaft.

The spindle cylinder is of heavy construction and is indexed at a constant speed. The indexing mechanism is patterned after the Geneva motion, the construction of which is relied upon to accelerate the heavy cylinder at the time of indexing and check its motion gradually without shock. An extra wide rectangular latch, engaging notches in the circumference of the spindle cylinder, furnishes the final indexing.



A Recently Developed Six-Spindle Automatic Screw Machine in Which Chains and Worm and Bevel Gears Have Been Eliminated

capable is being handled, the production may be increased by subdividing the longer operations, such as drilling, box tooling, etc., with a resulting reduction in the time required to finish the piece to a fraction of what would otherwise be necessary.

The base of the machine, which forms the chip pan and oil reservoir, extends to the floor, thus dispensing with legs. In this way a broad foundation is obtained, which in conjunction with the weight of the machine is relied upon to prevent vibration and insure accurate work. The portion of the bed located directly beneath the work has a slant of 45 deg. toward the rear of the machine, so that chips and the work as cut off are carried to the side. The chip pan is wider on this side and slopes toward the rear, where the oil well and strainer are located. In this way the oil drains off before the chips are removed, thus making it possible to rake out the chip pan without stopping the machine or removing the splash apron. After the oil passes through the strainer into the well it is pumped back to the work.

The spindles are chrome nickel steel forgings, heat treated, hardened and ground and run in

The threading spindle is driven independently of the others, and its speed can be varied, through a set of change gears, to suit the requirements of the work being handled. The threading mechanism operates independently of the tool slide, and the die is run on and off while the box tools are in operation. The insertion of an extra gear in the train which drives the threading spindle enables left-hand threads to be cut by reversing the motion of the spindle in threading, while the cutting tools remain the same. The tool slide is of rigid construction and the design tends to balance the thrust of the work. The ways are large and long with a view to eliminating overhang. The cam for the tool slide is laminated similar to a leaf spring. This arrangement, it is emphasized, permits the cam to be adjusted to all lengths of work within the capacity of the machine. The camshaft is driven through a large internal gear on the inner circumference of the feed cam drum. The direction of rotation of the spindles is right hand, thus enabling standard tools to be used.

Hand control levers on each side, within easy

reach of the operator, are provided to stop or start the power feed instantly. In addition, a hand feed crank is provided for testing all feed movements and tool positions, which tends to save breakage in setting up, testing and adjusting tools. The gears used throughout have machine cut teeth.

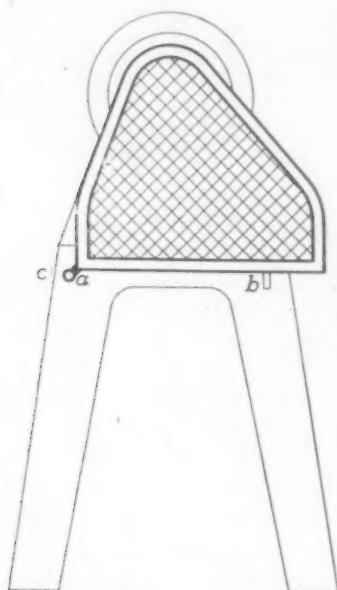
As far as possible exterior piping has been avoided in the oil distributing system. This has been made possible by conveying the oil through the under side of the tool slide into a chamber at the center surrounding the driving shaft bushing. From this point it is tapped off at the circumference through short tubes to the individual tools. The oil pump supplying the system is driven at a constant speed.

GEAR GUARD FOR LATHES

Pivoted Device for the Headstock Change Gears Always Fastened to the Tool

BY SIDNEY K. EASTWOOD

The proposition of guarding the gears on the ends of the lathes in the machine shop gave the safety department a great deal of trouble. The



A Type of Guard for the End of a Lathe Headstock Which Is Always Fastened to the Tool

first guards built were similar to the one shown in the sketch, and were fastened to the ends of the lathes by brackets and set screws. To remove the guard for changing gears for different speeds of the lead screw the machinist had to take these screws out and remove the guard entirely. Then the trouble commenced, for most of the men were too indifferent to their own safety to take the trouble to put the guard back. So to make it easy for the man to remove the guard and as easy for him to put it back, guards were built which reached to the floor so that all the man had to do was to set the guard one side and then put it in place again. But this failed to work, and a good many guards were found standing along the machine shop wall.

The best remedy found for the trouble was to build the guards similar to the one shown. This type is as near fool proof as possible and has the advantage of always being fastened to the lathe. There is a slight chance that it will not cover the gears at all times, but experience showed that the workman will put it back after he has changed his gears. The guard itself is made as the first ones were, but is not fastened to the lathe by brackets and set screws. The guard has a socket at the back which fits over a pin at *a*. This pin is fastened to the frame by tapping a hole and cutting threads on the pin. At the front a support, *b*, is made from a piece of flat stock and fastened to the frame. Another support is placed at the back of the frame at *c*. This gives a guard which will stay in place by

its own weight. To change gears the workman has only to lift the guard so that it rests on the support *c*. Then when the gears are changed he can easily pull it back in place.

The tendency to leave the guard in its upward position is small, as the guard in that position is so prominent that the chance of forgetting it is at a minimum. Its prominence also enables the foreman to see at a glance when the gears are uncovered.

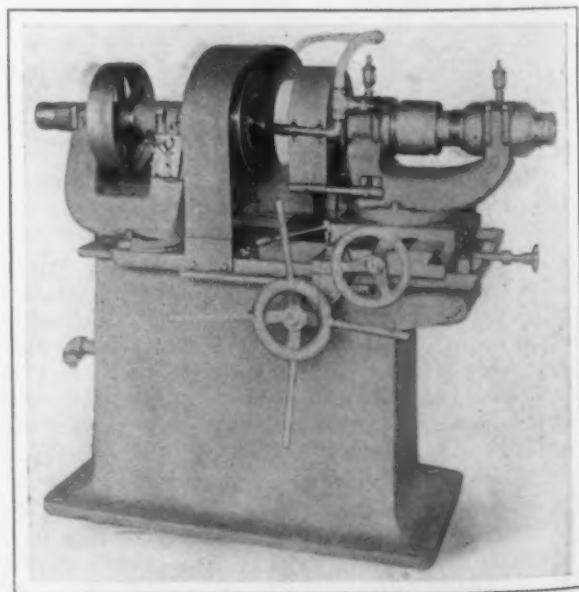
Face Grinding Machine with Magnetic Chuck

A face grinding machine equipped with a rotary magnetic chuck for handling work up to a maximum diameter of 14 in. has been brought out by the Bridgeport Safety Emery Wheel Company, Inc., Bridgeport, Conn. The headstock is arranged to pivot to any angle and in designing the machine an effort has been made to secure extra wide bearings for all the sliding faces.

As will be noticed from the accompanying illustration the machine is wide spread. Both the headstock and the emery wheel head pivot to any angle. With this arrangement it is pointed out that in the case of the latter, when a cup wheel is being used, only part of the cutting rim comes in contact with the piece being ground, and in this way it is possible to grind concave, convex or flat pieces, as may be desired. The wheel head is moved to the work by a pilot wheel, rack and pinion, with an adjusting screw at the back, which is relied upon to act as a stop and prevent the wheel going too far forward, while a slight turn of the hand nut permits the wheel to be fed to the work. The wheel head has taper sleeve bearings with an adjustment to take up wear and check nuts for keeping the bearings in position. The emery wheel is fed across the work by a handwheel and screw, the latter being either single or double thread, as may be desired.

The base of the machine forms a reservoir for holding water, and a centrifugal pump supplies it to the work in large quantities to dissipate the heat generated by the grinding operation.

The height of the spindle center above the floor is 42 in., and the ways are 12 in. lower than the spindle center. The weight of the machine, which is belt-driven, is 2450 lb.



A Recently Developed Face Grinding Machine with Magnetic Chuck and Pivoting Headstock

ELECTRIC ARC WELDING

What a Manufacturer of Electrical Machinery Has to Say of the Subject

Arguing that electric arc welding is one of the greatest labor-saving processes which have come into the field of the iron and steel industry, J. F. Lincoln, vice-president of the Lincoln Electric Company, manufacturer of motors, generators, lifting magnets and voltage regulators, Cleveland, Ohio, recently had the following to say:

The electric arc may be applied to practically all metals which are to be welded. There are several difficulties which must be encountered, notably, expansion and contraction, which is likely to leave internal strains if not compensated for.

There are two methods of applying the arc and both these methods have considerable to do with the speed of operation. The first and easiest method of application is with an arc formed between the piece to be welded and a carbon electrode. In such a weld as this, the amount of heat which can be liberated is unlimited, therefore, the rapidity of melting is also unlimited. In any steel casting or in some boiler plate, this scheme can be used and will result in very high speed of operation, enormously faster than it is possible to get with any other method of working.

WELDING SHEET METAL

For thin sheet metal, the method used is that of the metallic electrode arc in which the electrode used is a piece of soft steel which of itself becomes the filler and is melted off of the electrode by the formation of the arc. This scheme has a very great advantage in that the heat will travel but a very short distance from the weld and the weld itself outside of the one spot where it is being welded remains at a low temperature, thus eliminating warping of the piece and internal stresses. The speed of this, however, is not nearly as high as it is possible to get by the use of the carbon arc but is favored on account of the fact that it eliminates warping and makes a softer weld than is possible with the carbon arc. It also eliminates almost entirely, all oxide in the weld.

Electric arc welding in its application is comparatively new and, like any new process, has been hedged about by the manufacturers of arc welding machines with a great deal of mystery which has resulted in a very slow application. This process is becoming increasingly popular, however, and is being rapidly adopted.

Another feature which has contributed to the slow application is the fact that the few manufacturers of welding apparatus have placed ridiculous prices on the welding machines and have cast around them as many supernatural qualities as possible.

TWO CLASSES OF ARC WELDING MACHINES

The one and only function of the welding machine is the saving of the power which is wasted by using resistance in series with any direct current standard voltage. The voltage across the arc in arc welding will vary from 15 to 50 volts depending on the length of the arc, the amount of current flowing and also the electrode used. It is self evident, therefore, that if this current is taken from a 250-volt direct-current supply from 200 to 230 volts must be dissipated in a resistance in series with this arc. A machine to save part of this wasted power is the application of all arc welding machines. The arc welding machines

which are manufactured are divided roughly into two classes, the one known as constant-voltage machine and the other known as drooping characteristic machine.

The ordinary constant-voltage machine is a motor generator set which will take current from the supply line at the voltage of the supply line and operate a constant-voltage compound wound machine at 75 volts for the welding circuit. It is necessary, of course, to have a resistance in series with this 75-volt machine in order to get the voltage down to the voltage required by the arc. A machine of this kind, however, generally is a good investment as it will show a considerable saving when continually used over the resistance in series with the 250-volt supply line. Any motor generator set of which the generator would give a voltage of approximately 75 with a piece of fence wire for resistance to use in series with the arc will give results equally as good and be just as economical.

The other type of machine and the machine which ought to be used if saving is the idea is a drooping characteristic machine which will generate a voltage exactly the same as that required at the arc. In other words, if the arc is short circuited, the voltage will drop to zero and as the arc is drawn whatever voltage is required across the arc, will be the voltage of the machine. A machine of this kind will pay for itself within a very short time after being put into operation and is the only machine which will show maximum economy in work of this kind. Machines of both classes are being manufactured at the present time.

A New Line of Single-Phase Electric Motors

For operating small machines of all kinds, the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has placed on the market a line of single-phase motors, built in sizes ranging from $\frac{1}{2}$ to 10 hp. inclusive for use on 60-cycle circuits. The smaller motors have cast-iron frames, while steel frameless construction is used for those having a capacity in excess of 2 hp. All sizes can be adapted for wall or ceiling mounting readily and in addition can be adjusted for clockwise or counter-clockwise direction of rotation easily or externally reconnected for operation on either 110 or 220 volt circuits. The motor starts as a repulsion motor, requiring only a small starting current and developing a large starting torque. As the motor comes up to speed a simple mechanically operated governor, located within the rotating element, changes the motor from one of the repulsion type to an induction motor automatically. A double-pole line switch ordinarily is the only starting device required, although automatic starters can be furnished, if desired, to reduce the starting current still further.

Turning Tool with Stellite Cutter

By employing the process mentioned in *The Iron Age*, December 17, 1914, for welding or brazing Stellite to a large section of machine steel, the Ready Tool Company, Bridgeport, Conn., has placed a new tool on the market. This is especially designed for turning shrapnel blanks, or where a limit of production is required. In this tool machine steel is used for the major portion of it with a section of Stellite anchored and brazed by the company's special process to form the cutting edge. It is expected that the use of this new tool will show an increased output of at least 25 per cent. whether used in a lathe or a boring mill.

A device that automatically reduces train speed to any desired rate whenever a train approaches a switch or crossover, gives a short, sharp signal audible to crew and passengers, and automatically stops a train entering a block that is not clear, has been brought out by the International Signal Company, 104 West Forty-second street, New York.

The Fatigue and Disease of Metals

An Analysis of Such Phenomena and Their Causes with Special Reference to the Liberty Bell—Deterioration of Aluminum and Tin

—BY PAUL KREUZPINTER—

In *The Iron Age* of February 18 and March 4 very interesting comments are presented on an expert opinion by Alexander E. Outerbridge, Jr., upon the danger of permitting the liberty bell, at Philadelphia, to be taken across the country to the Panama Exposition, on account of its condition. Mr. Outerbridge was entirely right in his conclusions as to the weakened condition of the bell and the liability of its breaking in two on the way, due to the extension of the existing cracks. When in Philadelphia a few months ago the writer visited the museum at Independence Hall and of course took a good look at the liberty bell, coming to the conclusion then, without having the least knowledge of the intention to send the bell away, that it should rest where it is, well supported and without being subjected to further shocks and vibrations which would prove detrimental to the venerable relic. The writer having had occasion, as part of his duties, to examine hundreds of broken specimens of material during 29 years, breaking being due to fatigue and disease, he agrees in every particular with the conclusions arrived at by the investigation made by Mr. Outerbridge, concerning the cause or causes of the cracking of the liberty bell.

PHENOMENA NOT NEW

It may be helpful for reference and the saving of time in hunting through a maze of technical literature, to analyze briefly the mysterious phenomena called fatigue and disease of metals. This undertaking is made difficult because of the complexity of the factors involved, being either purely chemical, or purely physical, or a combination of both. The condition has been known for many years, the writer hearing mention made of it when receiving instruction in metallurgy at the Royal Polytechnic College of Munich, Germany, 58 years ago. But little was known then of the causes of the disease of metals and their liability to fatigue until the advent of the classical researches of Woehler, and later of Bauschinger. It was not until the middle of the last century that iron was used in large quantities for structural purposes, with steel following in the eighteen-sixties. Previous to that period tin, lead and bronze were the only materials for observation. While lead had been used for hundreds of years for roofing and tin for utensils, the former was used principally in climates where the disease would not appear, or only sporadically, and copper was used in northern climates for roofing, the use of the latter preventing the appearance of the disease.

Metals may become diseased due to purely chemical reaction, as was the case a few years ago at an aluminum factory in Europe where the entirely new stock of aluminum utensils in the storehouse began to disintegrate while lying on the shelves, some more rapidly than others, producing a complete loss of the stock. The Royal Testing Laboratory at Charlottenburg, Germany, then under the direction of Dr. A. Martens, was asked to investigate this and it was found that, in the preparation of the aluminum, acidulated water had been

used with disastrous consequences. Probably other cases of modern origin could be, or could have been traced to a similar more simple cause. The phenomenon becomes more complicated, however, in the case of the pipe organs, mentioned by Mr. Outerbridge, or in the shipload of Banca tin, which turned into powder and in numerous other cases observed in recent years, affected by what is called the tin pest.

CAUSE OF DISEASE OF METALS

What is the cause of this pest, or rather, what is the primary cause of the disease of tin, lead, aluminum and other white metals as well as bronze, iron and steel? Metals are composed of a mass of crystals, each crystal is composed of a mass of molecules, each molecule is again composed of a mass of atoms, according to the researches of Faraday, Roberts Austin, Chernoff, Osmond, Howe, Heyn and others. All these authors agree that metals are not only very sensitive to impressions from extraneous forces, but that metals also have properties analogous to organic substances, as for instance to the influence of changes of temperature which changes, even under ordinary climatic conditions, may, and often enough do produce disease of metals. In his celebrated lecture, "On Certain Properties Common to Fluids and Solid Metals," delivered by Dr. W. Chandler Roberts Austin before the Royal Institution, March 26, 1886, he says:

"We are in the habit of regarding metals as typical solids. I hope to trace this evening the analogies of their behavior under certain conditions with that of fluids, and the following list shows the order in which I propose to group the properties common to fluid and solid metals:

- Rejection of impurities on solidification.
- Surfusion.
- Flow under pressure.
- Change due to compression.
- Absorption of gases.
- Absorption of liquids.
- Diffusion.
- Vaporization.
- Surface tension.

"The transition from the liquid to the solid state is marked by the same phenomena in the case of many metals, as is observed in certain fluids."

In another part of the same lecture Roberts Austin says: "There are two other properties which solid metals possess, in common with certain fluids. The first is the power of dissolving gas which metals in the solid colloid condition possess. As Dr. Odling and I have, in a course of lectures delivered here, shown that just as solid palladium occludes hydrogen so the alloy of rhodium and lead occludes nitrogen, which it gives up with explosive violence on heating in vacuo, suggesting an analogy with fluid nitro-glycerine. The last property which I have to submit to you, is the power which certain metals possess of taking up fluids, sometimes with a rapidity which suggests the miscibility of ordinary fluid substances. Here is a bar of tin, 1 in. wide, and $\frac{1}{2}$ in. thick; if a little mercury is lightly rubbed

on it the mercury will in 30 seconds penetrate the mass so that it breaks readily, although before the addition of the mercury, the bar would bend double without any sign of fracture." . . . "I have shown (Report of British Association, 1883), that in the case of molten metals the interdiffusion may be extremely rapid, but, with regard to solid metals, experiments conducted by Sir Frederick Abel prove that carbon can pass from a plate of richly carbonized iron to one of iron free from carbon, against which it is tightly pressed. This passage of carbon takes place at the ordinary temperature, and it is difficult to explain the transference of matter without admitting the presence of some action closely allied to the diffusion of liquids."

UNSTABLE CONDITION A DIRECT CAUSE

The writer has offered these quotations from so eminent an authority as an introduction to that condition of metals which are termed stable and unstable, and which condition is the direct cause of the so-called tin pest. Cast metals of all kinds are in an unstable condition, the more or less rapid cooling having left the crystalline mass in a state of tension, this tension being so intense as to produce cracking in harder metals, like steel castings, unless this tension is relieved by annealing, producing an equilibrium, or, as we might call it, a restful condition of the molecules. During this period of instability the physical forces as well as the chemical constituents of a metal may assume two different forms, each form possessing a different property.

Thus, an unequally cooled bronze casting, composed in addition of a bad mixture, a condition which undoubtedly prevailed in the liberty bell, would be in an extremely unstable state of tension, possessing different properties in different parts of the structure. Such an unstable condition of a mass of metal is termed allotropic, indicating a condition when the same substance in a structure or mass of metal may possess different properties. This instability constantly tries to equalize itself, an endeavor which is powerfully assisted by changes in temperature of housing or climate. Softer metals like lead, tin, aluminum, mercury, sulphur, more easily assume the allotropic or double property form, and, because of their lower melting points, are more easily affected by changes in temperature.

Tin exists in the allotropic form of a gray powder and a workable metal. Above the ordinary temperature of the air tin is a workable metal in an unstable condition, trying to return to its stable form in a state of gray powder. Whenever, therefore, the temperature falls below the ordinary temperature of the air tin becomes diseased and crumbles into a gray powder. In a similar way lead, aluminum, and other substances change from the unstable to the stable form, frequently with deteriorating results, with changes of temperatures to lower degrees. The rapidity and extent to which these changes take place, or what seemingly prevents their taking place, depends on a variety of conditions difficult to be defined.

The chemical purity of a metal, the stored up force in the metal and the force by which it has been compacted into a solid mass of greater or less density and given various shapes, probably are powerful antidotes, so to speak, in preventing a metal becoming diseased. Hence the appearance of the disease of the softer metals more often in cold climates or cold weather than in warm climates or warm weather.

In another article the relation of disease to the fatigue of metals will be considered.

Employment of Minors in Alabama

A new law enacted in Alabama regulates the employment of minors and provides for an inspection of their places of work. Summarized, the provisions of the law are as follows:

After September 1, 1915, no child under 13 years old, and after September 1, 1916, no child under 14, shall be permitted to work at "any gainful occupation, except agriculture or domestic service," except that boys 12 years of age or older may be employed in business offices and mercantile establishments in towns of less than 25,000 population when the public schools are not in session. No child under 16 years old shall be employed more than 6 days or 60 hours a week, nor more than 11 hours in any one day, nor before 6 a. m. or after 6 p. m. Printed notices, on forms to be provided by the State, showing working and meal hours for minors must be posted. Especially noteworthy is the following:

No child under the age of 16 years shall be employed, permitted or suffered to work at any of the following occupations: Operating or assisting in operating . . . boring or drilling presses; stamping machines used in metal or tinware manufacturing . . . or in washer or nut factories; metal or paper cutting machines; . . . steam boilers; . . . wire or iron straightening or drawing machinery; rolling-mill machinery; power punches or shears; . . . or in proximity to any hazardous or unguarded gearing; . . . in connection with any processes in which dangerous or poisonous acids are used; . . . nor in clogging; nor in occupations causing dust in injurious quantities.

Before a child under 16 may be employed in any work an employment certificate must be obtained through the superintendent of schools and be filed subject to inspection by the State authorities. In cases where employees are apparently under that age and no certificate has been obtained the inspector may require the employer to furnish proof that they are older than 16. Children under 16 employed in mills, factories and manufacturing establishments must attend school at least eight weeks every year, of which six weeks must be consecutive.

The State prison inspector and his assistants are charged with enforcement of the law and are empowered to inspect all establishments it is required that employed. In all such establishments it is required that the places of work be kept in sanitary condition and properly ventilated; that suitable closets, separate for each sex, be provided. Sanitary drinking fountains are to be maintained when 20 or more persons are employed. Penalties are provided for various offenses under the law, including obstruction of inspection by the proper authorities.

Diesel Motor-Driven Ships in Denmark

The annual report of Burmeister & Wain, ship-builders, Copenhagen, Denmark, says the London Iron and Coal Trades Review, shows profits of £111,400 (\$542,127) for 1914 as compared with £69,000 (\$335,788) for 1913. A distribution of the same dividend, 7 per cent., or £39,000 (\$189,793), has been declared. For several years the firm has been working on the problem of a perfectly safe and economical Diesel motor for ships. A considerable amount of work and capital has been spent on the experiments, which have been followed by substantial success. It is considered that the experimental stage is now passed. Ship-owners are much interested in the new type of ship, and a number of orders have already been placed. The first Diesel-motor vessel built in Norway on the design in question has already made her maiden trip. In Belgium a good start had been made when the war broke out, but for the time being a further exploitation of the company's patents in European countries is out of the question. In America, however, the Union Company of Los Angeles has acquired the rights, and a factory for the motors has been erected and started. The yard at Copenhagen is said to have work on hand which will fully occupy it until the end of 1918.

STEEL MILL ELECTRIC MOTORS*

Suggestions on Handling Repairs and Compiling Statistics of Their Cost

BY G. E. STOLTZ†

The introduction of motors on the main roll drives occurred only 10 years ago, but during this period approximately 275,000 hp. has been installed. The growth has been a steady and healthful one, and the total yearly sales are found to be almost proportional to the tonnage of steel produced. The change from steam to electric drive has not taken place due to any whims or peculiar ideas of the mill operators, but is done entirely to reduce the cost of producing steel.

When electrical apparatus was first introduced in steel mills, it was often placed in the care of the steam engineer, and was given no more attention than that required to keep it running. To-day the electrical man has been added to the engineering or operating force to suggest schemes of reducing the cost of production.

Practically all plants have their daily report sheets which are sent to the electrical department, specifying the repairs made and consequent delays incurred. Each company knows in its own way the cost of upkeep, but it would no doubt be better for the Association of Iron and Steel Electrical Engineers to adopt some standard method of keeping a record of repairs and depreciation. A summary could be made of the inspectors' reports and at the end of the month it could be determined for each line of motors what per cent. of failures are due to commutators, armatures, bearings, or fields. It would not be policy to try to get too much data on these sheets as they would become burdensome and would not receive the attention desired from the inspectors. There would be a number of factors which would influence the results obtained, but all of them would be local and well understood by the operator when the summary sheets would be compared.

DAILY REPORT SHEETS FOR REPAIR COSTS

The segregated cost of repairing each particular line of apparatus could be tabulated on a separate sheet. By specifying the type of motor at the top of the sheet the form could be used for any make in the plant. The inspectors report their opinion of the defect and cause of failure; both of these items would, of course, be checked in the repair shop and the correct data placed in the monthly summary sheet. Should the inspector and the repair man disagree, the electrical superintendent could give it his attention, and as much profit would be gained as if correct data were submitted by each. It is just as important to discover discrepancies in the inspectors' reports and correct their interpretation of the trouble as to know the full details of the failure itself.

In one column is a space for the time lost to the mill while the repairs are being made. Very often the apparatus can be modified during a period when the mill is down, and no delay incurred. At one plant it was estimated there was a loss of \$500 each hour the blooming mill was delayed. It is difficult to place a definite value on these delays, but no one appreciates their importance more than the operators in a steel mill.

The first half of such a sheet would be compiled during the month as the apparatus is repaired, and the latter half at the end of the month, as it is simply an itemized review of the former. The sheet would bring out distinctly the relative cost of repairing different parts of each line of motors. In order to compare the cost of repairs from month to month, it is advisable to plot curves, a point being added each month. The first curve would show the total cost of inspection, labor and material for repairs. In addition to this curve, others should be plotted for each line of motors, which would permit the operator to compare the cost of maintaining each line of machines in his plant.

All this work could be performed by a clerk and at the end of each month only a very short time would be

required for the electrical superintendent to check the cost of operating his department as compared with previous months. The actual figures obtained could be reviewed, but they do not convey the facts so clearly and rapidly as can be done graphically. Suppose it was noticed that the cost of repairs on some particular feature of a certain make of motors was predominant. This could be investigated and the reason for the high maintenance cost determined. It might be that a large tonnage output justified the abuse of the electrical apparatus, or some adjustment or change in the control would more adequately protect the motor. The operation of a charging machine could be slowed down to protect the apparatus better, but the reduced maintenance cost on an application of this kind would not be justified where it is so important to handle the metal with great dispatch and obtain a larger tonnage output.

However, there are examples of motors being reversed or plugged by foreign operators who do not appreciate the characteristics of electrical machines. Manual control could be replaced by magnetic switches which would give slower operation when starting and reversing, but would not in any way interfere with the tonnage record. Again, it might be found to be due to a lack of proper attendance, or, upon further collection of data from similar motors in the plant, a common weak feature might be discovered which could only be remedied by the manufacturer.

WHAT STUDYING REPAIR COSTS HAS SHOWN

At one of the largest steel plants of the country, after compiling data for a period of time, the electrical superintendent determined that a large percentage of his motor trouble developed at the commutators. To remedy this he designated a capable man from his department to do nothing but study commutation problems. This man is trying out different types of brushes, has studied the results obtained by undercutting, and, in general, has become expert in his particular line. Very satisfactory results have been obtained as maintenance has been reduced quite appreciably.

At another plant it was discovered that the failure of bearings on a certain line of motors was excessive. The increase in the total maintenance was hardly noticeable, but by careful analysis it was found that this item was entirely out of proportion. The electrical superintendent is now giving his close attention to this item and may find it can only be eliminated by purchasing a more expensive bearing.

Another firm had approximately 180 motors of one make and 7 of another. All operated under practically the same conditions, but the maintenance on the 7 motors was far in excess of the total repairs required by the remaining 180. The loss of time and cost of repairs for the 7 motors was so great that the electrical superintendent asked to discard them entirely, stating that a saving would be enjoyed by replacing them with the better type of motor.

UTILIZING RIVALRY BETWEEN FOREMEN

An electrical superintendent in an Ohio plant places the supervision of all his apparatus under two general foremen, who report directly to him. Definite records and curves are compiled and the results given to both foremen. Naturally considerable rivalry is obtained between the two men, and every effort is exerted on their part to make a good showing without any direct pressure being exerted by the electrical superintendent. If this scheme was followed out to the extent of placing the result of the monthly reports in the hands of the inspectors directly in charge of the apparatus, a certain amount of interest and pride would be developed by each department without any direct effort on the part of the electrical superintendent. If the rank and file of the department can see for themselves exactly what is happening and are allowed to compare the performance of the apparatus in their department with that in other departments, better economy cannot help but result. This scheme would also automatically advise the electrical department of any applications giving unsatisfactory service before it is brought to their attention by the general superintendent, or by some other department.

*From a paper presented at a meeting of the Association of Iron and Steel Electrical Engineers held at Pittsburgh, March 6, 1915.

†With Westinghouse Electric & Mfg. Company.

SECONDARY USES OF COMPILED DATA

Occasionally the electrical man is aware that certain applications have excessive delays and maintenance, but is unable to persuade the mill superintendent to change the installation in any way which would involve an increase of cost. If actual data could be given to the mill superintendent outlining to him the cost of maintaining certain apparatus for the year, he could be more easily persuaded to make a change such as replacing manually operated controllers by magnetic switches.

Very often data compiled in such a complete form can be used to advantage for other information than that for which it was primarily compiled. At one plant a load having a poor power factor was added, and it was found desirable to raise the power factor on the whole system. The electrical superintendent at this plant not only kept a record of repairs, etc., but had taken graphic curves on each motor installation which were characteristic of the load cycle to which it was subject. After reviewing his repair chart, it was found that the maintenance on motors carrying practically full load was very little in excess of that for the machines under-loaded. It was therefore decided to replace the latter with smaller motors so that practically all of his machines were working full load. After all changes were completed the increase in power factor was 8 per cent.

It is difficult to assume a depreciation charge on electrical apparatus as the life of each line of motors not only depends on their own construction, but on the service to which they are applied. No doubt in some cases their depreciation and repairs are so great that it would be far better to purchase new apparatus and throw the old out. The life of a mill motor which is subject to continuous reversing duty naturally could not be expected to be as long as that of a machine with a practically constant load and installed in a clean room where excellent care is taken of it. Nothing but definite figures kept for a number of years can determine the actual depreciation which should be charged against a particular type of machine.

EFFECT OF COBALT ON STEEL

Improves the Static but Not the Dynamic Properties—Annealing Impossible

An important paper on cobalt steels was presented recently before the Institution of Mechanical Engineers (England) by Prof. J. O. Arnold of Sheffield and Prof. A. A. Read of Cardiff, under the title, "Chemical and Mechanical Relations of Iron, Cobalt and Carbon." It forms one of a series, presented at intervals. Vanadium, manganese, chromium and nickel, were considered earlier and a paper on molybdenum is in preparation.

First a summary was given of the results of previous investigations on the influence of cobalt on steel—those of Sir Robert Hadfield, of Guillet and of G. Boecker. As a basis of the investigations of Arnold and Read five ingots were melted by coke in white crucibles from pure Thermit cobalt, Swedish bar iron and Swedish white iron, charged together, small quantities of pure manganese and aluminum being added 10 minutes before teeming. The steels were cast into molds about 2 in. square. The ingots were reheated and hammered down into bars 1 in. round. The analysis of the five steels was as follows:

| Combined carbon, per cent. | Graphitic carbon, per cent. | Cobalt, per cent. | Silicon, per cent. | Manganese, per cent. |
|----------------------------|-----------------------------|-------------------|--------------------|----------------------|
| 0.64 | None | 2.68 | 0.05 | 0.16 |
| 0.62 | None | 5.50 | 0.07 | 0.18 |
| 0.84 | None | 11.18 | 0.09 | 0.23 |
| 0.93 | None | 16.97 | 0.10 | 0.23 |
| 0.72 | 0.07 | 20.85 | 0.11 | 0.25 |

Phosphorus and aluminum both 0.02 per cent. or under.
Sulphur 0.04 per cent. or under.

These steels were tested as received from the forge, any heat treatment having endangered a precipitation of the carbon as graphite. In the lathe little or no difference could be detected while the bars were being

turned. All were reported as tough as judged by the capability of the steel to curl off the tools in spirals.

The influence of cobalt on the tensile strength was marked. Steel lowest in cobalt gave a maximum tensile strength of 48.4 tons per sq. in. while the highest one in cobalt yielded 71.3 tons tensile strength. The yield point rose similarly, the lowest being 29.2 tons per sq. in. and the highest, 40 tons. The ductility as measured by the elongation in 2 in. fell with the rise in cobalt. Tests on the Arnold alternating stress machine showed that the lower the cobalt the greater the number of alternations endured, falling about half as the cobalt was increased.

Analyses showed that the carbon present was combined with the cobalt as the carbide Co_3C to the extent of only 5 to 6 per cent. of the total cobalt present in the steels high in carbon and containing up to 20.85 per cent. cobalt. The remaining 94 to 95 per cent. of cobalt is alloyed with the iron and manganese.

In determining the effect of annealing, the bars were annealed by heating in a gas-fired furnace for about eight hours to 1436 deg. F., soaked at this heat for one hour, and the steel allowed to cool for about 24 hr. In the steel lowest in cobalt only a trace of the carbon was precipitated as graphite by annealing. With 5.5 per cent. cobalt two-thirds of the combined carbon passed into graphite. In the higher cobalt steels the carbide disappeared completely being transformed into graphitic carbon. The striking effect of annealing on the cobalt steels is shown by the following table:

| | Unannealed | Annealed |
|----------------------------------|-------------|----------------|
| Combined carbon, per cent. | 0.93 | None |
| Graphitic carbon, per cent. | None | 0.93 |
| Cobalt, per cent. | 16.97 | 16.97 |
| Yield point, tons per sq. in. | 38.00 | 18.90 |
| Maximum stress, tons per sq. in. | 75.30 | 29.2 |
| Elongation in 2 in., per cent. | 9.50 | 23.6 |
| Reduction of area, per cent. | 12.70 | 41.9 |
| Fracture | Crystalline | Black graphite |

The combined carbon is all changed to graphitic; the tensile strength and yield point are reduced about 60 and 50 per cent. respectively. The high ductility and reduced area in the annealed steel with no combined carbon are remarkable.

Comparing the behavior of cobalt with nickel in steel, the authors state that a comparison is interesting because nickel and cobalt have been commonly considered identical in their properties. In their own words:

"Cobalt is not nearly such a great graphite precipitator as nickel. Cobalt-steel ingots can be hammered down to 1-in. bars with only a very small separation of graphite, 0.07 per cent. in the highest member of the series, containing 20.85 per cent. of cobalt. In the case of nickel-steel ingots treated in exactly the same way as the cobalt-steel ingots, a small separation of graphite began with only 3 per cent. of nickel, and when 7 per cent. of nickel was present the precipitation of graphite amounted to about 42 per cent. of the total carbon. Cobalt carbide appears, then, to be much more stable than nickel carbide, a conclusion which is also borne out by the analysis of the carbide residues obtained by electrolysis from cobalt and nickel steels.

"Cobalt does not form a definite solid solution or cobaltide of iron like that formed by nickel, having a composition corresponding to the formula Fe_3Ni , which, with only 0.1 per cent. of carbon present, registers a maximum stress of about 90 tons per sq. in., associated with a reduction of area of 45 per cent. An alloy containing about 13 per cent. of nickel, and 0.6 per cent. carbon, is so hard that it is impossible to machine it, whereas in the present series of cobalt steels, in which the carbon ranged from 0.62 to 0.93 per cent., and the cobalt from about 2.7 to 20.9 per cent., all the alloys, without any annealing, machined with the greatest ease. The hardness, as measured by maximum stress, seems with equal carbon to rise with the cobalt."

The paper contains a careful micrographic analysis of each steel with photomicrographs.

The New York office of the Harry E. Campbell Company was removed on April 26 from 1123 Broadway to 8 West Fortieth street.

Business Men to Investigate Taylor System

Will Oppose the Labor Union Move
to Cut Off Government Work
from Shops Operating Under It

WASHINGTON, D. C., April 27, 1915.—A thorough investigation of the Taylor system of scientific shop management, as operated in the manufacturing establishments under the supervision of the Ordnance Bureau at the Watertown and Frankford arsenals, has been undertaken by the Chamber of Commerce of the United States and within a few days President Fahey will announce the membership of a special committee of seven to prosecute the inquiry. In the meantime, General Secretary Goodwin has begun the collection of data bearing on the subject with a view to expediting the work of the committee. The investigation is to be conducted from the business man's standpoint and for the benefit of business men. Incidentally and indirectly, it is probable that the work of the committee and the effect of its findings will be of material assistance to the War Department in the efforts which have been so vigorously prosecuted during the past three or four years under the leadership of General Crozier, chief of the Ordnance Bureau, to install and develop scientific shop management in the arsenals.

LABOR WOULD BAR TAYLOR SYSTEM SHOPS

In deciding to investigate the use of the Taylor system in government workshops the officers of the Chamber of Commerce express the belief that the existing situation calls for prompt and vigorous action, not only in the interest of the Government, but on behalf of the manufacturers of the country whose interests are likely to be seriously affected should Congress, after the various investigations now on foot, enact a law positively forbidding the employment of scientific shop systems in Government establishments. Such a law, experts have declared, would be as serious a backward step for the Government as if a law should be enacted forbidding the use of electricity in Government manufacturing plants. The chief interest which private manufacturers have in the threatened legislation is the fact that the labor leaders no longer make any secret of their intention, in the event that the Taylor system is forced out of Government establishments, to go to Congress with a demand for the passage of a law forbidding the purchase of Government supplies of any kind from manufacturers in whose plants scientific shop management systems are in use. In fighting the War Department's battle, therefore, the business men of the country are opposing a movement, the ultimate object of which is to place restrictions upon all the manufacturers who desire to sell goods to the Government almost as drastic and ruinous as would be a prohibition against the use of any type of labor-saving machinery.

It is desired that the Chamber of Commerce committee shall be fully informed, not only regarding the Taylor system, but its development and use in the Government arsenals, so that they will be able to meet all objections that may be brought forward by the opponents of the system. The committee is to investigate the various allegations made concerning abuses which it is said have grown up under the system at the arsenals, especially the oft-repeated assertion that employees have been "speeded up to the breaking point." The committee will arrange to visit the Watertown and Frankford arsenals either in a body or by a sub-committee. Effort will be made to frame a report well in advance of the next session of Congress and it is among the possibilities that the findings may be laid before President Wilson as the basis for a suggested recommendation to be incorporated in his next annual message to the Senate and House.

INDUSTRIAL COMMISSION AND TAYLOR SYSTEM

The United States Commission on Industrial Relations, which has given more or less time during the

past year to an investigation of the Taylor system in the Government arsenals, will soon hold a meeting for the purpose of outlining its final report, which must be submitted to Congress before the commission expires by statutory limitation on August 23 next. This investigation was begun before the full commission in this city some months ago. Since the adjournment of Congress a sub-committee has visited Watertown and Frankford and has taken the testimony of the chief officers in charge of the two arsenals, the superintendents and many employees. It seems probable, however, that at least a majority of the commission will unite in a report sustaining the Taylor system as employed in the arsenals and discrediting the charges and criticisms that have been made against it in and out of Congress.

MEN PROTEST AGAINST WORK TICKETS

The length to which organized labor is prepared to go in restraining scientific shop management methods has just been demonstrated in salient fashion in the Washington Navy Yard. No attempt has ever been made in any of the establishments under the supervision of the Navy Department to install the Taylor system, but from time to time innovations have been made looking to greater efficiency. During the past week, however, the local union, affiliated with the Machinists' International Association, which embraces the employees of the Washington Navy Yard, numbering some 1400 men, held a meeting for the purpose of preparing protests to be submitted to the officers in charge of the yard. In a statement made public after the meeting it was said that the employees felt that a point had been reached "when an emphatic protest must be registered against, not only the further extension of the present system of shop management, but also against parts of the system that have already been put into operation." Organized labor, it was stated, "is unalterably opposed to these so-called systems of scientific management, whether they be called the Taylor system or not, primarily because of the drastic uses to which they can be put, and often times it has been thought necessary to protest against apparently innocent innovations, due to the fact that several of these, innocent in themselves, when put together form an oppressive shop arrangement, in the opinion of those affected, not at all unlike a 'strait-jacket.'" The necessity for action, it was stated by speakers at the meeting, was due to the proposed introduction of a so-called "progress section"—a system of cards under which the yard managers are able to keep track of the work and to locate any particular job without loss of time, but in which, the speakers at the recent meeting declared, "the employees see an opportunity for the management to meddle continuously with their duties throughout the day."

A "HARASSING" ESTIMATING DEPARTMENT

Another high-handed innovation on the part of the yard managers, against which protests were made at the meeting referred to, was the installation of an estimating department. For years the Government has operated its manufacturing plants—with the possible exception of the departments under the supervision of the War Ordnance Bureau—with little or no regard to cost of production. Lack of reliable figures has been especially embarrassing to the accounting officials at the end of the fiscal year when the appropriations are running low and later in the summer when estimates are prepared for transmission to Congress. To furnish desired data regarding costs and expenditures, therefore, an estimating department was installed in the Washington Yard. But the workmen at the meeting referred to declared that "a great deal of this work is

unnecessary and merely adds to the cost of production, harassing the men without compensating advantages to the Government." A committee of the union has been appointed to take the matter up with the proper authorities "with a view to arriving at satisfactory conditions in the workshop at the Washington Navy

Yard." The result of this movement will be awaited with much interest, especially because the Secretary of the Navy is known to be out of sympathy with the efforts of the officers in charge of navy yards and gun foundries to bring these plants up to date by more efficient systems of shop management. W. L. C.

Minnesota Iron Ore Rate Down to 55 Cents

Decision of the Interstate Commerce Commission—The New Rate Made Effective June 15

WASHINGTON, D. C., April 27, 1915.—The existing rate of 60 cents per gross ton for the transportation of iron ore from the lines of the Mesaba range in Minnesota to vessels at Two Harbors and Duluth, Minn., and to Allouez Bay, Wis., is held to be unreasonable and a rate not exceeding 55 cents, effective June 15, is prescribed for the future in the final report of the Interstate Commerce Commission upon the comprehensive investigation prosecuted during the past three years. No finding is made by the commission with respect to rates from the mines on the Vermillion and Cuyuna ranges, but the significant statement is made in the report that representatives of the roads serving the Cuyuna range have declared that even if no order were entered with respect to them the rate fixed for the Mesaba range would be controlling.

The first step in this important case was taken in December, 1908, by Leon E. Lum, who was interested in certain iron ore properties and who filed a formal complaint against the Great Northern Railway Company, alleging an excessive rate from Grand Rapids, Minn., to Superior, Wis. This proceeding was ultimately abandoned, but the developments incident thereto were of such a character that the commission decided to institute an investigation regarding the entire question of iron ore transportation in Minnesota.

VOLUNTARY REDUCTION TO 60 CENTS

From figures compiled by the commission from official sources, the tonnage of iron ore handled by the defendant railroads is given at approximately 27,500,000 tons as the annual average for the five-year period ending with the season of 1915, assuming that the tonnage this year is no larger than in 1914. About 95 per cent. of this ore is from the Mesaba range. The rate for the transportation of iron ore from the Vermillion, Mesaba and Cuyuna ranges to the docks at Two Harbors, Duluth, Allouez Bay and Superior is uniformly 60 cents per long ton regardless of distance. This rate covers the service from the mouth of mine to the dock and loading into the boats. Prior to the season of 1912 the rate was 80 cents from the mines on Mesaba range, 90 cents from Tower on the Vermillion range, and \$1 from Ely on the same range. The rate from the Cuyuna was 65 cents. On November 30, 1911, the Iron Range and the Mesaba roads voluntarily reduced the rates of \$1, 90 and 80 cents to 60 cents, and shortly afterwards the Great Northern and the Soo met this reduction. The weighted average haul was obtained by dividing ton-miles by the tons from the Mesaba range is 108.23 miles over the Great Northern (five years ending June 30, 1912); over the Mesaba road, 77.43 miles (five years ending December 31, 1913), and 67.07 miles over the Iron Range road (five years ending December 31, 1913). The average haul from the Vermillion range is 89.32 miles. From both ranges over the Iron Range road the average distance is 70.56 miles. Excluding the Great Northern, the average for the other two roads is 74.48. From the Cuyuna range the average distance is given as about 112 miles.

The rate of 60 cents has been attacked as unreasonably high in and of itself, there being no charge of discrimination except that it is argued that a rate in excess of a reasonable rate would be tantamount to a

rebate to the United States Steel Corporation, which controls the Iron Range and the Mesaba; and this argument has not been met by the carriers.

VALUATIONS OF ORE ROADS

Taking up the data furnished by the defendant roads in the light of the testimony of experts employed by the independent steel manufacturers, the conclusion is reached that a fair valuation for the Duluth & Iron Range Railroad would be \$22,130,635, for the Duluth, Mesaba & Northern, \$28,464,955, and for the Great Northern \$23,624,672. Taking this valuation of the Iron Range as an average applicable to the past five years, the total operating expenses, taxes and capital charges at 7 per cent. are figured at 44.69 cents per long ton of ore carried, while the rate for the Mesaba is given at 42.05 cents. Exact data regarding the Great Northern are not available for the determination of a corresponding cost per ton, but the commission reaches the conclusion that practically every comparison that can be suggested between the ore lines of the Great Northern and the Iron Range and Mesaba points to very large profits on the ore traffic of the Great Northern, perhaps equal to those on the other two roads.

INDEPENDENT ORE AND STEEL CORPORATION ORE

It was argued that the average cost of carrying all the ore should not be controlling on the ground that there is a difference in the cost of carrying the ore of the Steel Corporation as compared with the cost of carrying the ore of the independent shippers. Extensive exhibits were submitted designed to show that on the Iron Range the amount of switching and dock storage and extra trackage required by the independent shippers increased the cost of carrying independent ore 10 cents a ton above that attributable to a ton of Steel Corporation ore. It is not contended by carriers that such a difference in cost warrants any difference in rates for independent shippers and the Steel Corporation, but that this fact should be taken into consideration in determining the rate to be allowed on all the ore. It may be questioned whether the exhibits on this point are sufficiently representative, but they leave no doubt that owing to its greater volume the ore shipped by the Oliver Mining Company, controlled by the Steel Corporation, is handled at slightly less expense per ton than the ore of the independent shippers.

An exhibit prepared by the auditor of the Iron Range in answer to an exhibit submitted by interveners show that from 1885 to 1913 the earnings of this road were sufficient to pay 10 per cent. annually not only on the original investment, but in addition also on the improvements made out of earnings; that is, upon the total property investment shown by ledger without deduction of depreciation, with a surplus of over \$19,000,000. A similar exhibit prepared by the auditor of the Mesaba shows that from 1893 to 1912 the net income of that road was \$30,000,000 in excess of what was necessary to pay 10 per cent. on every dollar of property investment shown on the ledger, and it must be remembered that this property investment in 1912 was over \$12,000,000 in excess of the capitalization outstanding less the amount held in the treasury. W. L. C.

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Plan for Reviving Merchant Marine

Efforts toward devising a practicable method for rehabilitating our merchant marine have not been abandoned. One brought forward by H. L. Aldrich, of International Marine Engineering, New York, was a few months ago submitted to the President, Cabinet officers and leading members of Congress, but could not then be taken up seriously, as the Administration was at that time endeavoring to secure the adoption of the bill for Government ownership, although it was favorably received by members of the Senate and the House of Representatives. It is referred to in the April issue of International Marine Engineering.

The proposed plan authorizes the United States, acting through a shipping board, to purchase a certain percentage of bonds in legitimate corporations operating ships in the foreign trade, and in this way give encouragement to the shipping industry. Another feature of the scheme is a provision for organizing a special naval reserve. It prescribes that only American citizens can benefit by this reserve, and in consideration of all masters, watch officers and seamen joining it they are to be paid the difference between the American rate of wages and the foreign rate of wages from a specific fund. Thus the United States would not only be building up a merchant marine in the foreign trade which would compete with other nations, but the Government would be training a large number of men for service in all branches of the navy in case of emergency, and at a fractional part of what their services would be if the men were regularly employed on naval vessels. The need of such trained men was made distressingly evident when the so-called Spanish war broke out. The navy at that time could not find the men to equip properly the many auxiliary vessels. Mr. Aldrich claims that by paying the money directly to the men who do the work, so as to bring their wages up to the American standard, greater economic results can be obtained than by paying subsidies on the tonnage basis. It is estimated that \$1,000,000 annually spent in this way will support sixteen ships of 5,000 tons, or eight ships of 10,000 tons, while \$2,000,000 would keep afloat twice this number of ships.

In view of the fact that the people of this country appear to be inexorably opposed to the payment of subsidies, notwithstanding the evident hopelessness of all attempts to increase our foreign merchant marine without Government aid, it would appear that the plan suggested by Mr. Aldrich is

worth trying. The Government would have a direct interest in the operation of steamship lines in which it acquired bonds, so that the money thus appropriated would not be merely a donation to the treasuries of these lines. This would avoid such abuses of subsidies as have been known in the past and which have cast odium on this method of stimulating business interest in ocean-going steamship lines. At the same time, under the other feature of the plan, the Government would be training an increasing number of men for possible service in the navy. It is to be hoped that careful attention will be given by our law makers to the impressive features of this plan, and that if it cannot be adopted in the precise form suggested it may prove to have foundations on which a scheme can be built that will secure the needed support to make it effective. Our statesmen must not give up this problem, but keep working at it until they arrive at a satisfactory solution.

Railroad Myopia

When the railroads were asking the help of every sort of business in their campaign for higher rates, they went to the length of saying that the advances were needed to make their credit good enough to allow them to make sorely needed expenditures. Business men in all lines understood what the hardening of these great arteries of the country's trade meant for many industries—the steel industry in particular—and they exerted themselves in the railroads' behalf. The rate advances are now in effect; but the country is not prosperous, and the railroads have not traffic enough to employ their rolling stock. Many locomotives have been stored and there is a large car surplus. At the same time it is evident that most of the railroads will make the mistake they have made time and again and postpone the buying of equipment until increasing business actually forces them into the market. The Railway Age Gazette points out that the builders of cars and locomotives, in order to reduce the loss due to the running on of heavy overhead charges, have offered very favorable prices, hoping to induce the railroads to buy. It adds that if roads able to obtain capital purchase equipment now they will make profitable investments, even though it be necessary to store the new equipment for a while; also that such buying will help the builders and give employment to large numbers of men now idle.

Perhaps it is too much to expect that the railroads will change their ways. They have given no sign, in all the months of the steel trade's distress, that those responsible for their policies have learned anything from their experience with the fluctuations in iron and steel values. While the steel companies have suspended dividends and some of them have lost heavily, money has been accumulating and railroad financing can be done to better advantage than in many months. It is characteristic of railroad executives to buy heavily when the steel trade is booming and thus not only to pay high prices, but to make it sure that they will not receive what they need in equipment and in track steel until after their lack of it shall have produced acute traffic congestion. The prediction may be safely made now that the next time the country's business advances toward the normal mark the railroads will be utterly unprepared to cope with it.

Export Opportunity in Machinery

A machine tool house whose product is widely sought for the equipment of gun and ammunition works has found it worth while, looking into the future, to turn its back on some part of the existing war business, with its immediate profitable returns, and seek out other foreign trade. Much was said of outside markets a few months ago, but many in the machinery trade seem to have forgotten them in the rush of current events. The company referred to has had its quest for business in new fields rewarded by orders from places and people never hitherto thought of as possibilities. Their trade had been dominated from Europe, chiefly Germany and England.

The details of this new business may not be discussed, but it can be said that American machinery is going where it seldom if ever went before. Some of the machine tool makers in thinking of export effort have concentrated too much on South American trade. There are other important countries. Some of them seem to the average American the ends of the world. But they are buyers. Trade with these peoples built up now, while Europe cannot supply their wants, may lack the spectacular qualities of shrapnel business, but in its possibilities of permanence and of increase it is far more to be desired.

The Trend in Railroad Operations

The Pennsylvania Railroad system embraces 4.8 per cent. of the steam railroad mileage of the country and conducts 14 per cent. of the freight ton-mileage movement and 13 per cent. of the passenger mileage. The statistics are somewhat fuller than those of the average road, so that, on the whole, the Pennsylvania report just issued is a document worthy of some study.

As indicated by the percentages mentioned, the density of traffic on the Pennsylvania Railroad system is abnormally large. Absolutely precise comparisons cannot be made, because the Pennsylvania's year is the calendar year and the statistics of the railroads as a whole, issued by the Interstate Commerce Commission, relate to the year ending June 30. A comparison of the Pennsylvania's average for 1913 and 1914 with the country's statistics for

the twelvemonth ended June 30, 1914, is nevertheless quite accurate. The Pennsylvania system's ton-mileage per mile of road was 33,500,000, against an average of 11,700,000 for the whole country. Its passenger mileage per mile of road was 389,000 against 142,000 for the country at large, so that the Pennsylvania's density of traffic is almost three times that of the other railroads of the country considered as a whole.

In *The Iron Age* of April 8 the Interstate Commerce Commission's statistics for the fiscal year 1914 were discussed, and the fact was brought out that for a long period of time the freight ton-mileage of the country has doubled at an average rate of once in 12 years, while there was such a doubling from 1901 to 1913, the year 1914 being an "off" year. This rapid increase occurred simultaneously with a very considerable increase in the mileage of road. In ten years, to June 30, 1914, the steam railroad mileage of the country increased 15.6 per cent., to 247,398 miles, while in the ten years to December 31, 1914, the Pennsylvania Railroad system's mileage increased only 9.6 per cent., to 11,991 miles. Its ton-mileage has been increasing of late at the rate of a doubling in 25 to 30 years. Thus the density has not been increasing as rapidly on the Pennsylvania system as on most other systems, the reason being that the Pennsylvania serves a territory which has been fairly well developed for a long time.

The Pennsylvania system has made more rapid progress, perhaps, than is generally realized, in the adoption of steel passenger and freight cars. At the close of 1914 it had, of regular first class passenger cars 1728 wooden and 1984 steel, the seating capacities being respectively 106,759 and 148,894 persons, so that in seating capacity—the true measure—the proportion was 58 per cent. steel in the case of this equipment. In dining cars the steel equipment represents more than 73 per cent. of the seating capacity. The most important classes of freight cars show the following numbers:

| | Wooden | Steel and steel underframe |
|--------------------|--------|----------------------------|
| Box | 34,362 | 51,761 |
| Gondola | 25,759 | 141,891 |
| Refrigerator | 1,878 | 5,806 |
| Stock | 1,304 | 2,401 |

Of the above cars 76 per cent. are steel or steel underframe. Of locomotives the Pennsylvania has 7491, with a total tractive power of 248,628,959 pounds. Of these 68, with a tractive power of 2,290,000 pounds, are electric. The tractive power of the electric locomotives is just a shade higher than that of the steam locomotives.

Of particular interest to the rail trade are the figures the Pennsylvania gives of the tonnage of rails used for replacement purposes. This replacement work has been fairly uniform, with the exception of the year 1908, when there was a squabble over specifications, and the 31,563 tons laid in that year represented chiefly if not entirely rails that had been carried over from the preceding years. In other years of the past ten the Pennsylvania's replacement rails varied only between the limits of 111,799 tons in 1911 and 170,972 tons in 1913. The replacements in 1914 involved 147,138 tons.

Inasmuch as it is traffic and not time that wears out rails, and statistics of rails used for replace-

ment are not issued by many roads, it is in point to compare the Pennsylvania's rail replacements with its traffic. In the five years 1905 to 1909 inclusive the Pennsylvania used 610,978 tons of rails for replacements, and did a total ton-mileage business of 163,742 million, making one ton of rails to every 268,000 ton-miles of freight. In the following five years, through 1914, the replacements were 745,843 tons, with 194,765 million ton-miles, making one ton of rails to 261,000 ton-miles of freight. The replacements appear heavier in the later period probably from the fact that 1908 pulled down very seriously the average of the preceding five years. The railroads of the United States carried 301,399 million ton-miles in the fiscal year 1913 and 288,320 million in 1914, so that if we divide the Pennsylvania factor of 261,000 into 295,000 million we shall obtain a fair suggestion of what the steam roads of the country should annually require of rails for replacement purposes. The quantity comes out at 1,130,000 tons. Various elements enter into the matter, however, including speeds, weight of rolling stock, character of rails purchased, etc., and the quantity obtained by this arithmetical process should be taken as a hint rather than as a definite conclusion.

Our Foreign Trade in March

The report of imports and exports of the United States for the month of March, just issued by the Bureau of Foreign and Domestic Commerce, shows a continuance of the high tide in our export trade which had been such a marked feature of the preceding five months. The exports of merchandise for March reached a total value of \$299,009,563, which is only about \$800,000 under the merchandise exports of February. Imports showed a heavy increase, amounting to \$158,040,216, as compared with \$125,123,391 in February. The excess of exports in March was \$140,969,347.

The excess of exports for the nine months ended with March reached the stupendous total of \$719,803,737, being an increase of \$234,934,400 over the corresponding period of the previous fiscal year. This showing demonstrates the great financial strength of the United States in international markets which has become such a feature of the world's finances in recent months. When these figures are taken into consideration, there is little wonder that the United States dollar stands so high in international exchange. The great growth in the imports of merchandise, however, appears to be an indication of heavily increased purchases abroad. The inward movement of merchandise is likely to become still greater even under existing conditions, while if the European war should suddenly cease this movement would undoubtedly assume much larger proportions. In this connection a significant remark made by a British financial journal may be quoted. Commenting on the splendid financial showing made by the Cunard Steamship Company for 1914, the London Economist of April 10 says: "It is almost certain that at the close of the war shipping companies will pass through a period of more or less serious depression. We shall not always be importing from the United States at our present rate." Our great excess of exports cannot be regarded as having the element of permanency.

RUSSIAN SHRAPNEL CONTRACTS

Wide Distribution of \$21,000,000 in Work for Canadian Car & Foundry Company

Publication has been made in the past week by the Journal of Commerce of New York of the following list of sub-contracts which it says have been placed in this country by the Canadian Car & Foundry Company. All the shipments to be made by these companies are presumably contributory to the execution by the Canadian Car & Foundry Company of its \$83,000,000 contract for shrapnel and howitzer shells for the Russian Government. It is understood that 5,000,000 such shells fully loaded and with timing mechanism and every other attachment complete are involved in the contract. The total of the sub-contracts enumerated is \$21,724,400. As will be seen in the comments following the list, it is incorrect in a number of particulars, but most of the sub-contracts have been let as stated, as *The Iron Age* learns on direct inquiry of the firms mentioned.

| | Value |
|---|-----------|
| Hydraulic Pressed Steel Company, Cleveland, Ohio | \$475,000 |
| American Rolling Mill Company, Middletown, Ohio | 930,000 |
| Barney & Smith Car Company, Dayton, Ohio..... | 1,122,000 |
| Page & Storms Drop Forge Company, Chicopee, Mass. | 202,500 |
| American Car & Foundry Company, New York... | 96,000 |
| Dayton Mfg. Company, Dayton, Ohio..... | 463,000 |
| Federal Pressed Steel Company, Milwaukee, Wis... | 1,850,000 |
| Northern Electric Company, Montreal, Can..... | 275,000 |
| United Lead Company, New York..... | 280,000 |
| Recording & Computing Machine Company, Dayton, Ohio | 6,000,000 |
| King Powder Company, King's Mills, Ohio..... | 130,000 |
| American Tube & Stamping Company, Bridgeport, Conn. | 67,500 |
| Michigan Brass & Copper Company, Detroit, Mich. | 2,400,000 |
| American Brass Company, Kenosha, Wis..... | 375,000 |
| *Auto Parts Mfg. Company, Detroit, Mich..... | 650,000 |
| *Vermont Farm Machine Company, Bellows Falls, Vt. | 650,000 |
| *Consolidated Mfg. Company, Toledo, Ohio..... | 550,000 |
| Robin Hood Ammunition Company, Swanton, Vt... | 15,000 |
| Wallace Barnes Company, Bristol, Conn..... | 35,900 |
| Lavigne Mfg. Company, Detroit, Mich..... | 21,000 |
| Draper Company, Hopedale, Mass..... | 14,000 |
| Pope Mfg. Company, Westfield, Mass..... | 42,000 |
| Yale & Towne Mfg. Company, New York..... | 71,000 |
| American Powder Works Company, Boston, Mass... | 50,000 |
| Corbin Screw Corporation, New Britain, Conn..... | 52,000 |
| Horatio Hickok Company, Burlington, Vt..... | 175,000 |
| United States Steel Products Company, New York | 840,000 |
| Mead-Morrison Company, Boston, Mass..... | 900,000 |
| Crocker Wheeler Company, Ampere, N. J..... | 450,000 |
| Platt Iron Works, Dayton, Ohio, and Brownell Company, jointly | 630,000 |
| Lauson Engineering Company, Levis, Que..... | 180,000 |
| Dayton Mfg. Company, Dayton, Ohio..... | 320,000 |
| Worcester Mfg. Company, Worcester, Mass..... | 480,500 |
| Page & Storms Drop Forge Company, Chicopee, Mass. | 50,000 |
| Blake & Johnson Company, Waterbury, Conn..... | 22,000 |
| Bridgeport White Metals Casting Company..... | 360,000 |
| Corbin Screw Corporation..... | 100,000 |

*Finishing only; no parts furnished.

The largest contract, as will be noted, is that of the Recording & Computing Machine Company, Dayton, Ohio, which takes in the detonating or timing devices for shrapnel. This is put at \$6,000,000, but it is in fact considerably over that sum. The company expects to execute this contract entire, without subletting. In the cases of the Barney & Smith Car Company and the American Rolling Mill Company, the information of *The Iron Age* is that the contracts are \$1,250,000 each. The contracts of the Platt Iron Works and the Brownell Company, Dayton, Ohio, are for machining shrapnel cases that will be turned over to them by the Barney & Smith Car Company. It is understood that sales of 1,100,000 lb. of copper tubing for shrapnel bands have been made for contracts now under way at Dayton.

There is no such company as the Bridgeport White Metals Casting Company, which is credited with \$360,000 worth of work. None of the producers of white metal castings at Bridgeport has received such an order. Though the Monumental Bronze Company of that city

has considerable war business it has not participated in the Canadian Car & Foundry Company work.

The Worcester Mfg. Company, Worcester, Mass., operates a foundry. It has not participated in the Canadian Car & Foundry Company contract. The question of deliveries may have been an obstacle here. It can be stated also that no contract was made with the Mead-Morrison Company of Boston, which is credited with \$900,000.

The contract of the Federal Pressed Steel Company, Milwaukee, runs considerably above the \$1,350,000 given in the list. This company is building an addition principally to handle foreign work.

The Hydraulic Pressed Steel Company, Cleveland, forges but does not finish shells, that work being done in Canada. This company also has a number of other orders for shrapnel forgings.

In the case of the Horatio Hickok Company, Burlington, Vt., the contract is entirely for wooden boxes for shells—no less than \$175,000 worth.

The Page & Storms Drop Forge Company, the Dayton Mfg. Company and the Corbin Screw Corporation, as shown, all received additional contracts after the first orders were placed.

In addition to the \$21,000,000 of contracts included in the list, the American Locomotive Company, the Pressed Steel Car Company and the United States Cartridge Company are named by the Journal of Commerce in connection with negotiations for \$10,000,000 each of the Canadian Car & Foundry Company business. Nothing authentic is known as to the result of these negotiations. The large contract attributed to the American Locomotive Company is known to be British and not Russian.

ADVANCES FOR NEW CONSTRUCTION

An interesting feature of the contract with Russia is thus stated by the Journal of Commerce:

The Canadian Car & Foundry Company in taking the contract from the Russian Government also assumed an option on all future orders of that Government for war materials on this side of the world, and the privilege to take up the order itself. Under the terms of the agreement, the Russian Government is to make advances to the Canadian company in cash, from time to time, of sums ranging all the way from \$750,000 to as high as \$4,000,000, and in one or two instances may receive as much as \$10,000,000, which funds are to be used for the extension of the company's plants.

It is stipulated that all of the cash advances made by the Russian Government must be preserved in a separate banking account by the Canadian company, and in the event of an abrogation of the contract, the right to do which is reserved in the event of the war terminating before the contract can be filled, all such funds which have been unexpended in building new additions to existing plants will have to be returned.

It is stated that whatever contingencies there may be as to the termination of the war are shared with the Canadian Car & Foundry Company by the various subcontractors.

Ferromanganese Shortage in Germany

"Nearly all the German steel works are beginning to suffer from the lack of ferromanganese because of the stoppage of Russian manganese ore. Instead they are extensively using spiegeleisen, of which there is a good supply. Several plants are already compelled to limit the proportion of ferromanganese to 10 per cent. using 90 per cent. of spiegeleisen." The foregoing is from a "neutral correspondent" recently from Germany, who is quoted in a recent issue of the London Ironmonger. The same observer reports considerable anxiety among owners of iron mines and steel plants in Germany over the shortage of labor. Some plants are employing only one-third of the ordinary number of workmen and attempts to use Russian, Belgian and French war prisoners are not successful.

The Minneapolis office of the Wagner Electric Mfg. Company, St. Louis, Mo., builder of generators and motors, has been moved to room 307, Security Building, from its former location at room 1040, Security Bank Building.

CONTENTS

| | |
|---|-----|
| A Machine Which Heats and Drives Rivets..... | 937 |
| Record of an English Blast Furnace..... | 938 |
| A Special Type of Slag Handling Crane..... | 939 |
| Interlocking Brick for Hot Stoves..... | 939 |
| French Steel Plants in War Time..... | 940 |
| Automatic Spur and Bevel Gear Machine..... | 942 |
| A Fixed-Throw Crank Grinding Machine..... | 943 |
| Indicator for Testing the Lead of Taps..... | 943 |
| A New Carburizing Agent..... | 943 |
| Book Reviews | 944 |
| Reclaiming Brass Sweepings | 946 |
| Blower Economy for Air Furnaces..... | 946 |
| Six-Spindle Screw Machine..... | 947 |
| Gear Guard for Lathes | 948 |
| Face Grinding Machine with Magnetic Chuck..... | 948 |
| Electric Arc Welding | 949 |
| A New Line of Single-Phase Electric Motors..... | 949 |
| Turning Tool with Stellite Cutter..... | 949 |
| The Fatigue and Disease of Metals | 950 |
| Employment of Minors in Alabama..... | 951 |
| Diesel Motor-Driven Ships in Denmark..... | 951 |
| Steel Mill Electric Motors..... | 952 |
| Effect of Cobalt on Steel..... | 953 |
| Business Men to Investigate Taylor System..... | 954 |
| Minnesota Iron Ore Rates Down to 55 Cents..... | 955 |
| Plan for Reviving Our Merchant Marine..... | 956 |
| Railroad Myopia | 956 |
| Export Opportunity in Machinery..... | 957 |
| The Trend in Railroad Operations..... | 957 |
| Our Foreign Trade in March | 958 |
| Russian Shrapnel Contracts | 958 |
| Ferromanganese Shortage in Germany..... | 959 |
| American Iron and Steel Institute Members..... | 959 |
| The Iron and Metal Markets..... | 960 |
| British Steel Exports | 973 |
| Award of 150-Ton Crane Contract for Norfolk Navy Yard | 973 |
| Personal | 974 |
| Steel Corporation's Earnings | 975 |
| No Trade Commission Hearings in New York..... | 975 |
| Obituary | 975 |
| Iron and Steel Institute Annual Meeting..... | 975 |
| Machine Tool Development..... | 976 |
| Steel Corporation Improvements..... | 976 |
| Pittsburgh and Nearby Districts..... | 976 |
| Inland Steel Company News | 976 |
| New Benzol Plant at Duluth..... | 976 |
| Machinery Markets and News of the Works..... | 977 |
| Belgian Machinery Agencies After the War..... | 985 |
| Trade Publications | 986 |

American Iron and Steel Institute Members

The following names were added to the list of active members by election April 23:

John C. Bradley, president Pratt & Litchworth Company, Buffalo, N. Y.
 Robert M. Donner, salesman Cambria Steel Company, Philadelphia, Pa.
 John M. King, Jones & Laughlin Steel Company, Pittsburgh, Pa.
 P. J. Moran, superintendent Detroit Iron & Steel Company, Detroit, Mich.

On the same date the list of associate members was increased by election as follows:

Rodney D. Day, William Tod Company, Pittsburgh, Pa.
 William J. Dean, vice-president Nicols, Dean & Gregg, St. Paul, Minn.
 Roy A. MacDonald, General Refractories Company, Pittsburgh, Pa.
 Eugene A. McKelvy, General Refractories Company, Pittsburgh, Pa.
 Roy A. Rainey, Rainey Coke Company, 52 Vanderbilt avenue, New York.
 Joseph S. Seaman, president Seaman-Sleeth Company, Pittsburgh, Pa.
 Burrows Sloan, sales manager Lebanon Valley Iron & Steel Company, Philadelphia, Pa.
 Scott Stewart, Rainey Coke Company, 52 Vanderbilt avenue, New York.

The Iron and Metal Markets

BASIC PIG IRON ACTIVE

Big Sales of Both Northern and Southern

Standard Oil Company Buys Tin Plate—Shipments and New Orders in Finished Steel Practically Balance

The steel trade appears to be holding its own and leaders in the industry are satisfied to do that, under all conditions. While the expansion looked for as spring advanced has not come, the average 70 per cent. rate of operations keeps up and with some large producers the total of April orders will make a better comparison with March than seemed likely early in the month.

The Steel Corporation's statement, showing March earnings one-third more than the total for January and February, reflected the much better promise for the second quarter and the very poor prices—even poorer than was generally known—realized on January and February shipments. The corporation's shipments and new bookings in April are expected to come out practically in balance.

This week interest has centered in primary markets and particularly in the buying of basic pig iron in nearly all districts outside of the East. These purchases are in part significant of the larger business of some steel companies and along with the week's developments in Southern pig iron have been a factor of encouragement.

A Youngstown steel company has bought 50,000 tons of basic iron, 17,500 tons of forge and 4000 tons of foundry, and a northern Ohio steel company 30,000 tons. On the basic iron the price was close to \$12.50 at Valley furnace. The basic iron purchases of two southern Ohio companies amount to 50,000 tons or more, half of it Southern iron. At Chicago a 10,000-ton sale has been made for steel foundry use in the St. Louis district. A trade of basic iron for iron ore is reported in the Mahoning Valley.

A Pittsburgh interest has sold 16,000 tons of basic iron for delivery at Genoa, at \$16 f.o.b. New York, or \$13.86 at furnace.

The Southern pig-iron market has stiffened under heavy buying, the April sales of Alabama furnaces amounting to nearly 250,000 tons. One producer is now asking \$9.75 for delivery in the last half of the year and in other cases \$9.75 is quoted for the fourth quarter, though \$9.50 is still the market for the second and third quarters.

In eastern Pennsylvania sales of 16,000 tons of Lebanon Valley low phosphorus iron have been made at about \$16 at furnace.

Speculation is entering into the pig-iron situation. In the South there is more buying on this account and at Buffalo a 50,000-ton lot was taken by non-consumers, while no small stocks are carried at furnaces for consumers not yet ready to take in the iron.

The week has brought few developments in exports beyond the distribution of contracts already widely published. Freights are easier and 30 shillings to Liverpool is now possible.

While London advices are that the 65,000 tons

of rails for South Africa will be divided between the Algoma and Dominion mills at £6 on ship at Atlantic port, efforts are still being made to place part of the business in this country. The question of freights and vessel room will decide.

Domestic rail orders include 16,000 tons taken by the Tennessee Company, part of it for the Southern Railway; 5000 tons placed by the Minneapolis & St. Louis and 3000 tons by the Chicago, Indianapolis & Louisville. The Pennsylvania Railroad's inquiry has been formally renewed and the possibility of a purchase by this system from a Canadian mill has come into the negotiations.

The Standard Oil Company has been in the tin plate market and one independent interest is credited with selling it 250,000 boxes at a substantial reduction from the \$3.25 basis. Welsh tin plates are firmer, tin plate bar production having been curtailed under the British Government's further engrossment of steel capacity.

Car business is a little better. The Chicago & Northwestern order for 2000 is about to be given out and the St. Paul is preparing specifications for 2000 to be built at its Milwaukee shops.

An additional 17,000 tons on the New York subway work has just been let. In the West the Anacosta's 4500-ton contract has developed sharp competition.

The decision on the Minnesota iron ore rate case reducing the freight from the mine to the dock from 60 to 55 cents, effective June 15, was more favorable to the roads than was expected. The petitioners aimed at a 40-cent rate. It is a question if this 5-cent reduction from a 60-cent rate will bring about a reduction on the old ranges, where on short hauls the rate is as low as 25 cents.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

| | Apr. 28, | Apr. 21, | Mar. 24, | Apr. 29, |
|---------------------------------|----------|----------|----------|----------|
| Pig Iron, Per Gross Ton: | 1915. | 1915. | 1915. | 1914. |
| No. 2 X, Philadelphia... | \$14.25 | \$14.25 | \$14.25 | \$15.00 |
| No. 2, Valley furnace... | 12.75 | 12.75 | 13.00 | 13.00 |
| No. 2, Southern, Cin'ti... | 12.40 | 12.40 | 12.15 | 13.75 |
| No. 2, Birmingham, Ala... | 9.50 | 9.50 | 9.25 | 10.50 |
| No. 2, furnace, Chicago* | 13.00 | 13.00 | 13.00 | 14.25 |
| Basic, del'd, eastern Pa... | 13.25 | 13.25 | 13.50 | 14.25 |
| Basic, Valley furnace... | 12.50 | 12.50 | 12.50 | 13.00 |
| Bessemer, Pittsburgh... | 14.55 | 14.55 | 14.55 | 14.90 |
| Malleable Bess., Chgo* | 13.00 | 13.00 | 13.00 | 14.25 |
| Gray forge, Pittsburgh... | 13.45 | 13.45 | 13.45 | 13.65 |
| L. S. charcoal, Chicago... | 15.75 | 15.75 | 15.75 | 15.75 |

| | | | | |
|--------------------------------------|-------|-------|-------|-------|
| Billets, etc., Per Gross Ton: | | | | |
| Bess. billets, Pittsburgh... | 20.00 | 20.00 | 20.00 | 20.00 |
| O.-h. billets, Pittsburgh... | 20.00 | 20.00 | 20.00 | 20.00 |
| O.-h. sheet bars, P'gh... | 21.00 | 21.00 | 21.00 | 21.00 |
| Forging billets, base, P'gh | 25.00 | 25.00 | 25.00 | 25.00 |
| O.-h. billets, Phila... | 22.02 | 22.02 | 21.52 | 22.40 |
| Wire rods, Pittsburgh... | 25.00 | 25.00 | 25.00 | 26.00 |

| | | | | |
|---------------------------------|--------|--------|--------|--------|
| Finished Iron and Steel, | | | | |
| Per Lb. to Large Buyers: | Cents. | Cents. | Cents. | Cents. |
| Bess. rails, heavy, at mill | 1.25 | 1.25 | 1.25 | 1.25 |
| Iron bars, Philadelphia... | 1.15 | 1.15 | 1.15 | 1.20 |
| Iron bars, Pittsburgh... | 1.20 | 1.20 | 1.10 | 1.30 |
| Iron bars, Chicago... | 1.15 | 1.15 | 1.12½ | 1.10 |
| Steel bars, Pittsburgh... | 1.20 | 1.20 | 1.15 | 1.15 |
| Steel bars, New York... | 1.369 | 1.369 | 1.319 | 1.31 |
| Tank plates, Pittsburgh... | 1.15 | 1.15 | 1.10 | 1.15 |
| Tank plates, New York... | 1.319 | 1.319 | 1.269 | 1.31 |
| Beams, etc., Pittsburgh... | 1.20 | 1.20 | 1.15 | 1.15 |
| Beams, etc., New York... | 1.369 | 1.369 | 1.269 | 1.31 |
| Skelp, grooved steel, P'gh | 1.12½ | 1.12½ | 1.10 | 1.20 |
| Skelp, sheared steel, P'gh | 1.17½ | 1.17½ | 1.15 | 1.25 |
| Steel hoops, Pittsburgh... | 1.25 | 1.25 | 1.25 | 1.25 |

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

| Sheets, Nails and Wire, | Apr. 28, 1915. | Apr. 21, 1915. | Mar. 24, 1915. | Apr. 29, 1914. |
|-----------------------------|----------------|----------------|----------------|----------------|
| Per Lb. to Large Buyers: | Cents. | Cents. | Cents. | Cents. |
| Sheets, black, No. 28, P'gh | 1.80 | 1.80 | 1.80 | 1.90 |
| Galv. sheets, No. 28, P'gh | 3.25 | 3.25 | 3.40 | 2.85 |
| Wire nails, Pittsburgh... | 1.55 | 1.55 | 1.60 | 1.40 |
| Cut nails, Pittsburgh... | 1.55 | 1.55 | 1.55 | 1.65 |
| Fence wire, base, P'gh... | 1.35 | 1.35 | 1.40 | 1.40 |
| Barb wire, galv., P'gh... | 2.10 | 2.10 | 2.10 | 2.00 |

| Metals, | Per Lb. to Large Buyers: | Cents. | Cents. | Cents. | Cents. |
|------------------------------|--------------------------|--------|--------|--------|--------|
| Lake copper, New York... | 21.00 | 20.50 | 16.00 | 14.50 | |
| Electrolytic copper, N. Y. | 18.62½ | 17.37½ | 15.37½ | 14.12½ | |
| Spelter, St. Louis... | 13.75 | 11.35 | 9.35 | 4.85 | |
| Spelter, New York... | 14.00 | 11.50 | 9.50 | 5.00 | |
| Lead, St. Louis... | 4.10 | 4.10 | 4.05 | 3.80 | |
| Lead, New York... | 4.20 | 4.20 | 4.10 | 3.90 | |
| Tin, New York... | 42.00 | 46.50 | 50.50 | 34.60 | |
| Antimony, Hallett's, N. Y. | 32.00 | 32.00 | 27.00 | 6.75 | |
| Tin plate, 100-lb. box, P'gh | \$3.25 | \$3.25 | \$3.35 | \$3.30 | |

| Coke, Connellsville, | Per Net Ton at Oven: | \$1.50 | \$1.50 | \$1.50 | \$1.85 |
|-------------------------|----------------------|--------|--------|--------|--------|
| Purnace coke, prompt... | 1.65 | 1.65 | 1.65 | 2.00 | |
| Purnace coke, future... | 2.00 | 2.00 | 2.00 | 2.40 | |
| Foundry coke, prompt... | 2.15 | 2.15 | 2.15 | 2.50 | |
| Foundry coke, future... | | | | | |

| Old Material, Per Gross Ton: | 11.75 | 11.75 | 12.00 | 12.75 |
|------------------------------|-------|-------|-------|-------|
| Iron rails, Chicago... | 14.00 | 14.00 | 13.00 | 15.50 |
| Iron rails, Philadelphia... | 9.75 | 9.75 | 9.75 | 11.50 |
| Carwheels, Chicago... | 11.00 | 11.00 | 11.00 | 12.00 |
| Carwheels, Philadelphia... | 11.75 | 11.75 | 12.00 | 11.50 |
| Heavy steel scrap, P'gh... | 11.00 | 11.00 | 11.00 | 10.75 |
| Heavy steel scrap, Phila... | 9.25 | 9.25 | 9.25 | 10.25 |
| Heavy steel scrap, Ch'go... | 12.00 | 12.00 | 12.00 | 11.50 |
| No. 1 cast, Pittsburgh... | 12.00 | 12.00 | 12.00 | 13.00 |
| No. 1 cast, Philadelphia... | 9.00 | 9.00 | 9.00 | 10.25 |
| No. 1 cast, Ch'go (net ton) | | | | |

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c. base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¾ in. plates. Plates over 72 in. wide must be ordered ¾ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

| Extras | Cents per lb. |
|---|---------------|
| Gauges under ¼ in. to and including 3-16 in. | .10 |
| Gauges under 3-16 in. to and including No. 8 | .15 |
| Gauges under No. 8 to and including No. 9 | .25 |
| Gauges under No. 9 to and including No. 10 | .30 |
| Gauges under No. 10 to and including No. 12 | .40 |
| Sketches (including straight taper plates), 3 ft. and over | .10 |
| Complete circles, 3 ft. in diameter and over | .20 |
| Boiler and flange steel | .10 |
| "A. B. M. A." and ordinary firebox steel | .20 |
| Still bottom steel | .30 |
| Marine steel | .40 |
| Locomotive firebox steel | .50 |
| Widths over 100 in. up to 110 in., inclusive | .05 |
| Widths over 110 in. up to 115 in., inclusive | .10 |
| Widths over 115 in. up to 120 in., inclusive | .15 |
| Widths over 120 in. up to 125 in., inclusive | .25 |
| Widths over 125 in. up to 130 in., inclusive | .50 |
| Widths over 130 in. | 1.00 |
| Cutting to lengths under 3 ft. to 2 ft., inclusive | .25 |
| Cutting to lengths under 2 ft. to 1 ft., inclusive | .50 |
| Cutting to lengths under 1 ft. | 1.55 |
| No charge for cutting rectangular plates to lengths 3 ft. and over. | |

Wire Products.—Prices to jobbers: Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots, annealed, \$1.35 to \$1.40; galvanized, \$1.90. Galvanized barb wire and staples, \$2.10; painted, \$1.60. Wire nails, \$1.55 to \$1.60. Galvanized nails, 1 in. and longer, \$1.20 advance over base price; shorter than 1 in., \$1.70 advance over base price. Woven wire fencing, 72 per cent. off list for carloads; 71 off for 1000-rod lots; 70 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

| Plain Wire, per 100 lb. | Nos. | 0 to 9 | 10 | 11 | 12&12½ | 13 | 14 | 15 | 16 |
|-------------------------|------|--------|--------|--------|--------|--------|--------|--------|--------|
| Annealed | ... | \$1.50 | \$1.55 | \$1.60 | \$1.65 | \$1.75 | \$1.85 | \$1.95 | \$2.05 |
| Galvanized | ... | 2.00 | 2.05 | 2.10 | 2.15 | 2.25 | 2.35 | 2.75 | 2.85 |

Wire Rods.—Bessemer, open-hearth and chain rods, \$25.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zeels, 3 in. and over, 1.20c. Extras on other shapes and sizes are as follows:

| | Cents per lb. |
|--|---------------|
| I-beams over 15 in. | .10 |
| H-beams over 18 in. | .10 |
| Angles over 6 in., on one or both legs | .10 |
| Angles, 3 in. on one or both legs less than ¼ in. thick as per steel bar card, Sept. 1, 1909 | .70 |
| Tees, structural sizes (except elevator, handrail, car truck and conductor rail) | .05 |
| Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909 | .20 to .80 |
| Deck beams and bulb angles | .30 |
| Handrail tees | .75 |
| Cutting to lengths, under 3 ft. to 2 ft. inclusive | .25 |
| Cutting to lengths, under 2 ft. to 1 ft. inclusive | .50 |
| Cutting to lengths, under 1 ft. | 1.55 |
| No charge for cutting to lengths 3 ft. and over. | |

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from February 11, 1915, and iron pipe from February 12, 1915, all full weight:

| Steel | | | Iron | | |
|--|-------|-------|---|-------|-------|
| Inches | Black | Galv. | Inches | Black | Galv. |
| ¼, ½ and ¾ | 73 | 82½ | ¼ and ½ | 66 | 47 |
| 1 | 77 | 85½ | ¾ | 65 | 44 |
| 1½ to 3 | 80 | 89½ | 1 | 69 | 54 |
| | | | 1½ to 2½ | 72 | 59 |
| Lap Weld | | | Reamed and Drifted | | |
| 2 | 77 | 86½ | 1½ | 56 | 43 |
| 2½ to 6 | 79 | 88½ | 1½ | 67 | 54 |
| 7 to 12 | 77 | 86½ | 2 | 48 | 56 |
| 13 and 14 | 63½ | .. | 2½ to 4 | 70 | 59 |
| 15 | 61 | .. | 4½ to 6 | 70 | 59 |
| | | | 7 to 12 | 68 | 58 |
| Butt Weld | | | Lap Weld, extra strong, plain ends | | |
| 1 to 3, butt | 78 | 87½ | 1½ | 65 | 55 |
| 2, lap | 75 | 84½ | 2 | 66 | 57 |
| 2½ to 6, lap | 77 | 86½ | 2½ to 4 | 70 | 59 |
| | | | 4½ to 6 | 69 | 58 |
| | | | 7 to 8 | 63 | 53 |
| | | | 9 to 12 | 58 | 47 |
| Butt Weld, extra strong, plain ends | | | Lap Weld, double extra strong, plain ends | | |
| ¼, ½ and ¾ | 68 | 55½ | 1½ | 58 | 47 |
| 1 | 73 | 64½ | 2 | 60 | 52 |
| 1½ to 1½ | 77 | 63½ | 2½ to 4 | 70 | 59 |
| 2 to 3 | 78 | 69½ | 4½ to 6 | 69 | 58 |
| | | | 7 to 8 | 63 | 53 |
| | | | 9 to 12 | 58 | 47 |
| Butt Weld, double extra strong, plain ends | | | Lap Weld, double extra strong, plain ends | | |
| ¼ | 63 | 54½ | 1½ | 58 | 47 |
| ½ to 1½ | 66 | 57½ | 2 | 60 | 52 |
| 2 to 2½ | 68 | 59½ | 2½ to 4 | 70 | 59 |
| | | | 4½ to 6 | 69 | 58 |
| | | | 7 to 8 | 63 | 53 |
| | | | 9 to 12 | 58 | 47 |

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from April 1, 1915, on steel, and from April 10, 1915, on iron, are as follows:

| Lap Welded Steel | Standard Charcoal Iron |
|------------------|------------------------|
| 1½ and 2 in. | 66 |
| 2½ in. | 63 |
| 2½ and 3 in. | 69 |
| 3 and 3½ in. | 74 |
| 3½ and 4½ in. | 75 |
| 5 and 6 in. | 68 |
| 7 to 13 in. | 65 |
| 1½ and 2 in. | 58 |
| 2½ in. | 50 |
| 2½ and 3 in. | 57 |
| 3 and 3½ in. | 61 |
| 3½ and 4½ in. | 63 |
| 5 and 6 in. | 57 |

Locomotive and steamship special charcoal grades bring higher prices.

1½ in., over 18 ft., 10 per cent. net extra.

2 in. and larger, over 22 ft., 10 per cent. net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

| Blue Annealed Sheets | |
|----------------------|---------------|
| | Cents per lb. |
| Nos. 3 to 8..... | 1.25 to 1.30 |
| Nos. 9 to 10..... | 1.30 to 1.35 |
| Nos. 11 and 12..... | 1.35 to 1.40 |
| Nos. 13 and 14..... | 1.45 to 1.50 |
| Nos. 15 and 16..... | 1.55 to 1.60 |

| Box Annealed Sheets, Cold Rolled | |
|----------------------------------|---------------|
| | Cents per lb. |
| Nos. 10 and 11..... | 1.45 to 1.50 |
| No. 12..... | 1.45 to 1.50 |
| Nos. 13 and 14..... | 1.50 to 1.55 |
| Nos. 15 and 16..... | 1.55 to 1.60 |
| Nos. 17 to 21..... | 1.60 to 1.65 |
| Nos. 22 and 24..... | 1.65 to 1.70 |
| Nos. 25 and 26..... | 1.70 to 1.75 |
| No. 27..... | 1.75 to 1.80 |
| No. 28..... | 1.80 to 1.85 |
| No. 29..... | 1.85 to 1.90 |
| No. 30..... | 1.95 to 2.00 |

| Galvanized Sheets of Black Sheet Gauge | |
|--|---------------|
| | Cents per lb. |
| Nos. 10 and 11..... | 2.25 to 2.40 |
| No. 12..... | 2.35 to 2.50 |
| Nos. 13 and 14..... | 2.35 to 2.50 |
| Nos. 15 and 16..... | 2.50 to 2.65 |
| Nos. 17 to 21..... | 2.65 to 2.80 |
| Nos. 22 and 24..... | 2.80 to 2.95 |
| Nos. 25 and 26..... | 2.95 to 3.10 |
| No. 27..... | 3.10 to 3.25 |
| No. 28..... | 3.25 to 3.40 |
| No. 29..... | 3.40 to 3.55 |
| No. 30..... | 3.55 to 3.70 |

Pittsburgh

PITTSBURGH, PA., April 27, 1915.

Developments of the week have been favorable, and the outlook is better than at any time this year. The large purchases of pig iron by steel makers, the sending out of inquiries for cars by the Pennsylvania Railroad and the greater interest of other railroads in the market are taken to mean that a large amount of new business will be placed in the near future. The leading steel makers have handled the price situation shrewdly and the market on plates, shapes and bars is quite firmly established at 1.20c. for May and June and 1.25c. for third quarter. New buying in April has not been as active as in March, and shipments by the mills not so heavy, but at the same time general consumers are showing more interest and, being impressed with the large amount of foreign business being placed, are more in the mood of specifying against contracts, fearing there may be delay later on in getting deliveries. Steel companies are steadily increasing their rate of operations, the Carnegie Company running this week to about 75 per cent. of ingot capacity and the smaller makers at a greater rate than at any time since last fall. Average prices each month on shipments have shown an increase over the previous month since the first of the year. Some mills are now quoting higher figures on blue annealed and galvanized sheets, the latter due to the further advance in spelter.

Pig Iron.—More activity was displayed in the local pig-iron market the past week than at any time in more than a year. The largest buyer was the Youngstown Sheet & Tube Company, which took 50,000 tons or more of basic iron, 17,500 tons of forge and about 4000 tons of foundry. The basic iron was about equally divided between the Ohio Iron & Steel Company and W. P. Snyder & Co. Deliveries on this iron start in May and run up to October, the price being \$12.50 at Valley furnace for May and June shipments; starting with July, quotations printed each week in the Pittsburgh market report of *The Iron Age* will govern the price. W. P. Snyder & Co. also made a deal with the Ohio Iron & Steel Company to give it ore and take about 25,000 tons of basic iron in payment, to use in filling their contract with the Youngstown Sheet & Tube Company; none will be shipped from the furnaces of the Shenango Furnace Company. The Ohio Iron & Steel Company also sold 10,000 tons of basic iron to the Cleveland-Cliffs Iron Company in exchange for ore, and the latter will sell the iron later in the open market. The Central Steel Company, Massillon, Ohio, bought 1000

tons or more of basic iron from Cleveland furnaces, and it is understood will also make contracts with furnaces in Cleveland on a sliding scale basis for its full supply of basic iron for its new open-hearth steel plant. W. P. Snyder & Co. have also sold 16,000 tons of basic iron to a buyer in London, England, for delivery to Genoa, Italy, at \$16, f.o.b. New York; the export freight rate from Sharpsville, Pa., being \$2.14, the iron thus nets the sellers \$13.86 at furnace, which is somewhat higher than the domestic market. The same firm has sold a lot of 1000 tons of Bessemer and one of 500 tons for export shipment, which will go out as soon as bottoms can be secured. There is a more active movement in foundry iron, but as yet sales are mostly in small lots. It is stated that founders are taking pig iron faster than at any time for some months. About May 10 the Shenango Furnace Company will blow in its No. 3 furnace on Bessemer iron, and No. 1, now on Bessemer, will then be changed over to basic. The heavy transactions in pig iron have naturally firmed up the market, but as yet prices are not any higher. Two leading sellers have stated that they will not part with any more basic iron at \$12.50, but will wait for a higher market. We quote: Bessemer iron, \$13.60; basic, \$12.50; malleable Bessemer, \$12.75; No. 2 foundry, \$12.75 to \$13; and gray forge, \$12.50, all at Valley furnace, with a freight rate of 95c. a ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—While few sales are being made, the market is firm. A leading Youngstown mill is quoting Bessemer and open-hearth sheet bars at \$20 for May shipment, \$21 for June and \$22 for July. A prediction has been made that sheet bars will sell at \$28 or \$29 per ton before the end of the year. Specifications against contracts are active. The Carnegie Company is still out of the market as a seller of sheet bars, having all the obligations it can take care of for some time. The two leading Youngstown steel mills are also reported to be well sold up. We quote Bessemer and open-hearth billets at \$19, and Bessemer and open-hearth sheet bars, \$19.50 to \$20, f.o.b. maker's mills, Youngstown; Bessemer and open-hearth billets, \$20, and Bessemer and open-hearth sheet bars, \$21, f.o.b. Pittsburgh. Forging billets are quoted at \$25 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take \$1 per ton extra. Axle billets are quoted at \$21 to \$22.

Ferroalloys.—The local ferromanganese market is much easier and fears of a shortage have almost disappeared. Last week a lot of nearly 700 tons of English ferromanganese reached Baltimore, and quite a large amount is now known to be on the way over. English 80 per cent. ferromanganese can easily be obtained at \$90, Pittsburgh, for prompt shipment and perhaps less. Low prices continue to rule on ferrosilicon, competition among the three furnaces that make this material being keen. We quote 50 per cent. ferrosilicon in lots up to 100 tons, at \$73; over 100 tons to 600 tons, \$72; and over 600 tons, \$71, delivered in the Pittsburgh district. We quote 10 per cent. ferrosilicon at \$16.25; 11 per cent., \$17.25; 12 per cent., \$18.25, all f.o.b. cars at furnace, Ashland, Ky., Jackson or New Straitsville, Ohio, each of these points having a rate to Pittsburgh of \$2 per gross ton. We quote 20 per cent. spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Structural Material.—Local fabricators report no important contracts placed the past week. The only large local work in sight is the new Baltimore & Ohio Railroad bridge in this city, about 12,000 tons, which has long been pending and about which nothing definite has developed. We quote beams and channels up to 15-in. on new orders at 1.20c., Pittsburgh, for second quarter, and 1.25c. for third quarter. As yet there has not been much new buying at these prices.

Plates.—Inquiries now in the hands of the steel car companies include 16,426 cars of different types for the Pennsylvania Railroad, while the Chicago & North-

western, the International Great Northern, the Rock Island and several other roads have inquiries out for 6000 to 8000 cars. It is estimated that from 225,000 to 250,000 tons of plates and shapes will be needed for the cars to be built by the steel car companies, and the Pennsylvania Railroad is in the market for about 50,000 tons of plates and shapes for the 4000 cars it will build at its Altoona shops. The general demand for plates is quiet, and all the mills are still pretty badly in need of business. We quote $\frac{1}{4}$ -in. and heavier tank plates at 1.15c. to 1.20c. for May and June shipment, while leading plate mills are quoting 1.25c. for third quarter.

Steel Rails.—Only small orders are being placed for standard sections. The demand for light rails is fairly active, the Carnegie Steel Company having received new orders and specifications in the past week for about 3500 tons. No important foreign inquiries for rails are in the market. We quote standard section rails made of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10 lb. section, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb., sections, 1.125c. The prices of light rails are materially shaded on large lots, and the rerolling mills are underselling makers of rails rolled from billets from 50c. to \$1 per ton.

Sheets.—As prices on spelter are again going skyward, galvanized sheets are much firmer, some mills quoting as high as 3.50c. The American Sheet & Tin Plate Company is still quoting 3.40c., and states it will take care of its regular customers at that price for the time being at least. Several mills that have fairly large stocks of spelter are naming 3.25c. to regular customers only. Prices on blue annealed sheets are firmer, two leading mills holding Nos. 9 and 10 gauge at 1.35c. minimum. We quote No. 28 Bessemer black sheets at 1.80c. to 1.85c.; No. 28 galvanized at 3.25c. to 3.50c.; Nos. 9 and 10 blue annealed sheets, 1.30c. to 1.35c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—Last week the Standard Oil Company placed an order with an independent mill for 250,000 boxes or more of tin plate at a very low price. The new demand is dull, but the mills are running to nearly 100 per cent. on contracts. On the small orders being placed 14 x 20 coke plates are selling at \$3.25 to \$3.35, but on a very desirable order the lower price could be shaded.

Wire Rods.—The demand is quiet. Specifications against contracts are only moderately active. We quote Bessemer, open-hearth and chain rods at \$25 to \$26, f.o.b. Pittsburgh.

Carwheels.—We quote standard 33-in. freight carwheels, 6 $\frac{1}{4}$ -in. rough bore, at \$15, and standard 36-in. passenger, the same bore, at \$21 per wheel, f.o.b. Pittsburgh.

Shafting.—Owing to the active demand from machine-tool builders and an increase in specifications from the automobile and implement trades, prices on shafting are much firmer, two leading makers holding at 68 per cent. off, and it would take a very desirable order to get a better discount. It is stated that the demand for shafting now represents from 65 to 70 per cent. of capacity of the makers, the highest rate reached in some time. We quote cold-rolled shafting at 68 to 70 per cent. off in carload and larger lots, and 63 to 65 per cent. off in small lots, f.o.b. Pittsburgh.

Railroad Spikes.—Specifications from railroads are disappointing to the spike makers, who expected they would be much heavier by this time. Shipments are going out in a moderate way only. We quote: Standard railroad spikes, \$1.35 to \$1.40; small railroad spikes, \$1.45 to \$1.50 in carload and larger lots, f.o.b. Pittsburgh.

Hoops and Bands.—It is stated that some contracts for bands have been made for third quarter delivery at

1.25c. at mill. The demand for hoops is not heavy, as large consumers are covered to July. Specifications are fairly active for hoops. We quote steel bands at 1.20c. on new orders for second quarter shipment, and 1.25c. for third quarter, and steel hoops at 1.25c. to 1.30c. at mill.

Skelp.—The inquiry for skelp has quieted down, and no orders of moment, either foreign or domestic, have been placed for some time. The mills have a fair amount of work ahead. We quote: Grooved steel skelp, 1.12 $\frac{1}{2}$ c. to 1.15c.; sheared steel skelp, 1.17 $\frac{1}{2}$ c. to 1.20c.; grooved iron skelp, 1.50c. to 1.55c.; sheared iron skelp, 1.60c. to 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Products.—Foreign inquiry for barb wire is still fairly active, but not so heavy as some time ago. Trade in wire products is showing a falling off in volume, which is usual at this season, and prices are only fairly strong. Few wire nails were sold at \$1.60, and very little plain wire at \$1.40; in fact, several mills never recognized these prices. Prices to jobbers on new orders are as follows: Wire nails, \$1.55 to \$1.60; galvanized nails, 1 in. and shorter, taking an advance of \$1.70 over this price, or \$3.30, and galvanized nails, 1 in. and longer, an advance of \$1.20, or \$2.80; plain annealed wire, \$1.35 to \$1.40; galvanized barb wire and fence staples, \$2.10 to \$2.20; painted barb wire, \$1.60, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. for cash in 10 days. We quote woven wire fencing at 72 per cent. off in carload lots, 71 per cent. off on 1000-rod lots and 70 per cent. on small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—Large consumers of steel bars continue to specify heavily against contracts and shipments in April by the Carnegie Steel Company will likely be the heaviest for any one month in its history. Consumers are anticipating their needs, fearing there may be delay later on in getting prompt deliveries. As yet, nothing has been done by the implement makers toward contracting for steel bars for the six months or year starting July 1, but negotiations have begun. Bar-iron mills report new orders a little more active, but are still far short of giving the mills full work. We quote steel bars on new orders at 1.20c. for second quarter and 1.25c. for third quarter. We quote common iron bars, made from part scrap, at 1.20c. to 1.25c., and test iron bars at 1.30c., f.o.b. Pittsburgh.

Merchant Steel.—The new demand for seasonable steels is heavier than for some time, and mill shipments in April will be the largest in any one month since last summer. Prices are reported firm. On small lots we quote: Iron finished tire, $\frac{1}{2}$ x $1\frac{1}{2}$ in. and larger, 1.30c. base; under $\frac{1}{2}$ x $1\frac{1}{2}$ in., 1.45c.; planished tire, 1.50c.; channel tire, $\frac{3}{4}$ to $\frac{7}{8}$ and 1 in., 1.80c. to 1.90c.; $1\frac{1}{2}$ in. and larger, 1.90c.; toe calk, 1.90c. to 2c. base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c.

Cold-Rolled Strip Steel.—Makers report the new demand active and specifications against contracts placed some time ago are coming in freely. There is some foreign inquiry, and two leading makers have taken some fairly large export orders. We quote hard-rolled steel, $1\frac{1}{2}$ in. and wider, under 0.20 carbon, sheared or natural mill edges, per 100 lb., \$2.75, delivered. Extras, which are standard among all the mills, are as follows:

| Thickness, in. | Extras for thickness | Extras for soft or intermediate tempers | Extras for straightening and cutting to lengths not less than 24 in. |
|------------------------|----------------------|---|--|
| 0.100 and heavier..... | Base | \$0.25 | \$0.10 |
| 0.099 to 0.050..... | \$0.05 | 0.25 | 0.15 |
| 0.049 to 0.035..... | 0.20 | 0.25 | 0.15 |
| 0.034 to 0.031..... | 0.35 | 0.40 | 0.25 |
| 0.030 to 0.025..... | 0.45 | 0.40 | 0.40 |
| 0.024 to 0.020..... | 0.55 | 0.40 | 0.50 |
| 0.019 to 0.017..... | 0.85 | 0.50 | 1.10 |
| 0.016 to 0.015..... | 1.25 | 0.50 | 1.10 |
| 0.014 to 0.013..... | 1.95 | 0.50 | 1.25 |
| 0.012..... | 2.30 | 0.50 | coils only |
| 0.011..... | 2.65 | 0.50 | coils only |
| 0.010..... | 3.00 | 0.50 | coils only |

Nuts and Bolts.—Owing to the higher prices being charged for raw materials, makers of nuts and bolts recently made a slight advance in prices. The new

demand is fairly heavy and revised discounts to the large trade are as follows:

U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed

| | |
|------------------------------|-------------------|
| 1/2 in. and smaller hex..... | 8.1c. per lb. off |
| 5/8 in. and larger hex..... | 7.3c. per lb. off |
| Square, all sizes | 5.8c. per lb. off |

Semi-Finished Tapped

| | |
|------------------------------|-----------------|
| 1/2 in. and smaller hex..... | 85-10-10-10 off |
| 5/8 in. and larger hex..... | 85-10-10 off |

Black Bulk Rivets

| | |
|--|-------------|
| 7/16 x 6 1/2, smaller and shorter..... | 80-10-5 off |
|--|-------------|

Package Rivets 1000 Pcs.

| | |
|---|--------------|
| Black, metallic tinned and tin plated.... | 75-10-10 off |
|---|--------------|

Rivets.—The demand for boiler rivets is slightly better, but for structural rivets is very dull. We quote structural rivets at 1.40c., and cone-head boiler rivets at 1.50c., f.o.b. Pittsburgh. On a desirable order these prices might be shaded about \$1 per ton.

Wrought Pipe.—Reports that the United Gas Company and the Penn Gas Company had placed orders with the National Tube Company for 175 miles of 12-in. line pipe to be rolled at Lorain mills are premature. The orders have not yet been placed, although the Tube Company expects to secure them shortly. An inquiry is out from Oil City interests for about 20 miles of 6 to 12 in. pipe. Orders for tubular goods placed in April will not be any heavier than in March, and may show a slight decrease. Prices on line pipe and plain end pipe are much firmer, and discounts on wrought iron and steel pipe are being firmly held.

Boiler Tubes.—The new discounts on charcoal iron tubes adopted April 10 are being shaded slightly by one or two mills. The new demand for locomotive and merchant tubes is only fair, and specifications for locomotive tubes on contracts placed some time ago are not active.

Old Material.—There is no betterment in the demand and the few sales being made are mostly between dealers for covering shorts. Two leading consumers in this district have their yards congested and are refusing to take in any more until the situation is relieved. The scrap trade at Youngstown is more active than in Pittsburgh, with prices ruling about 50c. per ton lower than here. It is claimed that the actual amount of scrap in sight is light, and for this reason dealers are hesitating to sell short, believing the market may soon take an upward turn. For delivery in Pittsburgh and nearby districts that take Pittsburgh freights, dealers quote about as follows:

| | |
|--|--------------------|
| Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery | \$11.75 to \$12.00 |
| Compressed side and end sheet scrap No. 1 foundry cast | 10.25 to 10.50 |
| Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district | 12.00 to 12.25 |
| Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa. | 9.25 to 9.50 |
| No. 1 railroad malleable stock | 11.75 to 12.00 |
| Railroad grate bars | 10.00 to 10.25 |
| Low phosphorus melting stock | 8.50 to 8.75 |
| Iron car axles | 13.75 to 14.00 |
| Steel car axles | 18.75 to 19.25 |
| Locomotive axles, steel | 13.25 to 13.75 |
| No. 1 busheling scrap | 19.75 to 20.25 |
| No. 2 busheling scrap | 9.75 to 10.00 |
| Machine shop turnings | 7.00 to 7.25 |
| Old carwheels | 7.75 to 8.00 |
| Cast-iron borings | 10.75 to 11.00 |
| *Sheet bar crop ends | 8.25 to 8.50 |
| Old iron rails | 12.00 to 12.25 |
| No. 1 railroad, wrought scrap | 12.75 to 13.00 |
| Heavy steel axle turnings | 10.75 to 11.00 |
| Heavy breakable cast scrap | 8.50 to 8.75 |
| | 10.75 to 11.00 |

*Shipping point.

Coke.—More activity is experienced in the coke trade than for some time. It is reliably stated that the Pittsburgh Steel Company has closed with the Rainey interest for 18,000 to 20,000 tons of furnace coke for the year commencing July 1, and the Clinton Iron & Steel Company has closed with a local interest for 10,000 tons of coke per month over the remainder of the year. Several inquiries are in the market, one for 15,000 tons per month and another for 12,000 tons per month, deliveries over remainder of the year. Prices on furnace coke for prompt shipment are easier and

standard makes are readily obtainable at \$1.50 per net ton at oven. We quote standard makes of blast-furnace coke for prompt shipment from \$1.50 to \$1.60; on contracts for delivery up to July 1, \$1.65, and for delivery over all of 1915, at \$1.75. Foundry coke, standard makes, prompt, \$2 to \$2.25; contracts, \$2.15 to \$2.30. The output is steadily increasing, the Connellsville Courier stating that the product of the upper and lower Connellsville regions for the week ended April 17 was 298,222 net tons, an increase over the previous week of 6000 tons, and the highest output reached in any one week for more than a year.

Chicago

CHICAGO, ILL., April 28, 1915.—(By Wire.)

The comparative isolation of this market from the effects of export orders for war purposes may permit a more accurate estimate of the state of business in normal channels. The rate of progress is slow indeed. There is in fact a suggestion that increases in mill operation schedules have rather exceeded the growth of specifications, and, where capacity in operation has not actually lessened, shipments are tending to run ahead of orders. Prospective business from the railroads is given greater prominence by reason of the proportions of other inquiry. The Chicago & Northwestern cars are to be placed this week; the Rock Island has indicated its need of 15,000 tons of rails and 5000 cars; the St. Paul is preparing specifications for 2000 cars to be built at its Milwaukee shops and buying other equipment now really needed, including Pullman cars; the Illinois Central has bought a few locomotives and 1600 tons of angle bars, of which more may follow, and the Pennsylvania Lines West will doubtless place some of their equipment orders to the advantage of this market. In structural steel there is a renewed prospect of 24,000 tons for completion of the St. Louis bridge, while the 4500 tons for the Anaconda Copper Company and the 1150 tons for the Chicago recreation pier will absorb some of the low price contract tonnage for which the mills are obligated to local fabricators. Under more recent contracts for steel at 1.15c. and 1.20c., Pittsburgh, substantial concessions are being made in the form of delivered quotations to encourage prompt specifying. Efforts to restrict implement bar contracts to a term of six months appear likely to be repeated, but this campaign is still in the future. Restrictions upon the marketing of galvanized steel products as a result of spelter scarcity are being felt with greater emphasis, the disturbed situation growing more rather than less acute. Pig-iron inquiry is steady, with a fair selling in lots up to 500 tons at firm prices. The American Steel Foundries has taken about 10,000 tons of basic.

Pig Iron.—For the present, inquiry for last half delivery appears to be very nearly satisfied, although some outstanding inquiry in lots up to 500 tons is reported. This quietness does not mean, however, that there are not many melters who have as yet made no inquiry for their last half requirements. These foundries, lacking any conclusive evidence of what their own business is to be for the remainder of the year, are disposed to postpone buying until the outlook becomes more clearly established. The price of Lake irons is quoted firmly on the basis of \$13 at furnace for the last half, while one interest which has been active in selling malleable iron is asking \$13.50 for fourth quarter; but this seems to be somewhat above the market. The situation in the South appears to be moving toward an advance to \$9.75 for the fourth quarter. The most conspicuous business of the week in this market was the closing of about 10,000 tons of basic by the American Steel Foundries, a purchase made largely for the purpose of maintaining a stock of low priced iron. The Lake Superior charcoal iron makers have enjoyed a much improved run of business in April as compared with March, largely due to sales in the East. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

| | |
|--|------------------|
| Lake Superior charcoal, Nos. 2 to 5..... | \$15.75 |
| Lake Superior charcoal, No. 1..... | 16.25 |
| Lake Superior charcoal, No. 6 and Scotch.... | 16.75 |
| Northern coke foundry, No. 1..... | \$13.25 to 13.50 |
| Northern coke foundry, No. 2..... | 13.00 to 13.25 |
| Northern coke foundry, No. 3..... | 12.50 to 13.00 |
| Southern coke, No. 1 f'dry and 1 soft. | 13.75 to 14.25 |
| Southern coke, No. 2 f'dry and 2 soft. | 13.50 to 13.75 |
| Malleable Bessemer | 13.00 to 13.25 |
| Standard Bessemer | 15.50 |
| Basic | 12.50 to 13.00 |
| Low phosphorus | 20.00 to 20.50 |
| Jackson Co. and Ky. silvery, 8 per cent..... | 16.90 |
| Jackson Co. and Ky. silvy, 10 per cent..... | 17.90 |

(By Mail)

Rails and Track Supplies.—The placing of one or two small lots of rails is the extent of new business in that direction, but a better showing has been made in track fastenings. There is further inquiry in the market for tie plates, the quantity being somewhat under 5000 tons. The Illinois Central has placed a portion of its rail-joint requirements totaling 1600 tons of high carbon angle bars, the order being divided between a local and an Eastern mill. We quote standard railroad spikes at 1.45c. to 1.50c., base; track bolts with square nuts, 1.90c., base, all in carload lots, Chicago; tie plates, \$23.25 to \$24.25, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—Bids are being received this week by the Anaconda Copper Company for steel for a smelter at Anaconda and an electrolytic plant at Great Falls, Mont., the aggregate of which is 4500 tons. The work is of a character requiring extensive fabricating and accordingly, aside from the desirability of the tonnage, interesting competition is expected to result. Prices for fabricated steel are still on a non-profit basis, although the contracts which most of the local fabricators made early in the year protect them on plain material at very advantageous prices. The recreation pier at Chicago, in which 1140 tons was involved and taken by the Morava Construction Company, is understood to have been typical of the prevailing low price competition. Other contracts taken by structural shops include 806 tons for the Omaha Grain Exchange building, placed with the Omaha Structural Steel Company; 285 tons for a bridge at Vancouver, Wash., which went to Smith & Watson; 273 tons for the Texas & Pacific Railroad at Dallas, to the American Bridge Company, and other jobs amounting to about 500 tons. It is understood that the Louisville & Nashville and Burlington railroads' bridge steel tonnages are to be placed shortly, while the approaches for the long uncompleted bridge at St. Louis, for which 24,000 tons will be required, are again receiving attention. The Chicago & Northwestern expects to place orders this week on the cars for which it has been asking prices. The American Car & Foundry Company has taken an order for 300 gondola cars and the Haskell & Barker Car Company an order for rebuilding 300 box cars. Plain material specifications are about in the same volume as in the past few weeks, with perhaps a trifling gain, but not enough to constitute a real improvement in the situation. We quote for Chicago delivery, from mill, 1.389c.

The tonnage moving from jobbers' stocks is only fair, but there is evidence of a considerable amount of small work in the increased number of orders. We continue to quote for Chicago delivery of structural steel out of store 1.75c.

Plates.—Except through a few favored channels, plate business is moving slowly and in thin streams. There is a falling off in the tank plate tonnage which has lately contributed largely to mill operations. The concessions in prices continue, and we quote for Chicago delivery of plates, from mill, 1.289c. to 1.389c.

We quote for Chicago delivery of plates from store 1.75c.

Rivets and Bolts.—The bolt market participates in the generally stable condition of prices as applied to semi-finished products, and in this season, during which there is but little contracting, business is largely routine. Quotations are as follows: Carriage bolts up to

$\frac{3}{8}$ x 6 in., rolled thread, 80-15; cut thread, 80-10; larger sizes, 75-17 $\frac{1}{2}$; machine bolts up to $\frac{3}{8}$ x 4 in., rolled thread, 80-20; cut thread, 80-15; larger sizes, 80-2 $\frac{1}{2}$; coach screws, 85-2 $\frac{1}{2}$; hot pressed nuts, square, \$6.60 to \$6.40 off per cwt.; hexagon, \$7.60 to \$7.30 off per cwt. Structural rivets, $\frac{3}{4}$ to 1 $\frac{1}{4}$ in., 1.50c. to 1.55c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2c.; boiler rivets, 2.10c.; machine bolts up to $\frac{3}{8}$ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to $\frac{3}{8}$ x 6 in., 75-10; larger sizes, 70-15 off, hot pressed nuts, square, \$6, and hexagon, \$6.70 off per cwt.

Bars.—Bar-iron tonnage last week was insufficient to provide full operating schedules for several of the mills in this district, and temporary shutting down was resorted to in these instances. The price, however, is being maintained with no apparent difficulty, on the basis of 1.15c., Chicago. There is little new in connection with steel bars and, although it is currently reported that the opening of books by some of the steel companies for the annual implement contracting is imminent, there is no verification to be had for this opinion. We quote for mill shipments as follows: Bar iron, 1.15c.; soft steel bars, 1.389c.; hard steel bars, 1.20c.; shafting, in carloads, 65 to 68 per cent. off; less than carloads, 60 to 65 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off, and in carloads, 62 per cent. off.

Sheets.—The difficulties attendant upon the manufacture of galvanized sheets as the result of the spelter situation are acutely accentuated, and the leading independent interest here is again entirely out of the market. There is a fair business in the heavier gauges of sheets, running into blue annealed, but one pass sheets are moving slowly. The business in special purpose material is fairly well sustained. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.939c.; No. 28 galvanized, 3.439c. to 3.589c.

Despite the skyrocketing of spelter prices and the general advance in galvanized sheet quotations out of store elsewhere, local prices on galvanized sheets out of stock continue at 3.65c. to 3.75c. We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.65c. to 3.75c.

Wire Products.—The business in wire has very largely assumed a routine activity with the exception of the galvanized products, for which higher prices are again being asked in view of the more extreme spelter scarcity. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.589; wire nails, \$1.789; painted barb wire, \$1.789; galvanized barb wire, \$2.289 to \$2.389; polished staples, \$1.789; galvanized staples, \$2.289 to \$2.389, all Chicago.

Cast-Iron Pipe.—The United States Cast Iron Pipe & Foundry Company is the successful bidder for the pipe to be bought at Sacramento, Cal., the tonnage running up to 10,000, if steel pipe is used for the large mains, and to double that tonnage if cast-iron pipe is used throughout. At Lockport, Ill., 450 tons is understood to have been taken by the Glamorgan Pipe & Foundry Company. On April 30, Cincinnati, Ohio, will ask figures on a total of 3400 tons and Montrose, Col., on 1500 tons. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$23.50; 16 in. and up, \$23, with \$1 extra for gas pipe.

Old Material.—Limited buying of cast borings and cast scrap by a steel maker was the most prominent activity of the week, although there was a general trading in moderate volume in most of the grades. Market prices appear to have settled to a low level, at which there is strength enough to hold them stationary in the absence of much buying, and as a result price changes are but few. Last week the Illinois Central sold 1500 tons of scrap, and other offerings include 1250 tons from the Burlington, a large list from the Baltimore & Ohio and 300 tons from the Lake Erie & Western. We quote for delivery at buyers' works, Chi-

cago and vicinity, all freight and transfer charges paid, as follows:

| Per Gross Ton | |
|--|--------------------|
| Old iron rails | \$11.75 to \$12.25 |
| Old steel rails, rerolling | 10.25 to 10.75 |
| Old steel rails, less than 3 ft. | 10.00 to 10.50 |
| Old carwheels | 9.75 to 10.00 |
| Heavy melting steel scrap | 9.25 to 9.50 |
| Frogs, switches and guards, cut apart | 9.25 to 9.50 |
| Shoveling steel | 8.75 to 9.00 |
| Steel axle turnings | 7.00 to 7.25 |
| Per Net Ton | |
| Iron angles and splice bars | \$11.50 to \$12.00 |
| Iron arch bars and transoms | 11.75 to 12.25 |
| Steel angle bars | 8.50 to 8.75 |
| Iron car axles | 13.50 to 13.75 |
| Steel car axles | 10.50 to 11.00 |
| No. 1 railroad wrought | 8.50 to 9.00 |
| No. 2 railroad wrought | 8.00 to 8.50 |
| Cut forge | 8.00 to 8.50 |
| Steel knuckles and couplers | 8.00 to 8.50 |
| Steel springs | 8.75 to 9.25 |
| Locomotive tires, smooth | 8.50 to 9.00 |
| Machine shop turnings | 5.00 to 5.25 |
| Cast borings | 5.00 to 5.50 |
| No. 1 busheling | 7.25 to 7.75 |
| No. 2 busheling | 6.25 to 6.75 |
| No. 1 boilers, cut to sheets and rings | 5.50 to 6.00 |
| Boiler punchings | 8.25 to 8.50 |
| No. 1 cast scrap | 9.00 to 9.25 |
| Stove plate and light cast scrap | 7.75 to 8.00 |
| Grate bars | 7.50 to 7.75 |
| Railroad malleable | 8.00 to 8.25 |
| Agricultural malleable | 7.25 to 7.50 |
| Pipes and flues | 6.50 to 6.75 |

Philadelphia

PHILADELPHIA, PA., April 27, 1915.

Confidence in the not far-distant future is sustained in every branch of the iron and steel trade. There are several bright spots in the market, particularly those presented by the issuance of railroad inquiries. It is certain, however, that more active buying is needed if optimism is to be maintained. The present hopefulness exists despite the admission that specifications are lighter in some directions and despite a hint that the railroads may not proceed vigorously to place orders against recent inquiries. The Pennsylvania Railroad has called for the re-submission of estimates on its 1915 rail requirements, though the question of price was believed to have been settled. The possibility of a saving through closer bidding is understood to be the cause of the railroad's move. In plates, shapes and bars quotations on prompt deliveries continue to be based on 1.20c., Pittsburgh, as a general thing, but there is less insistence on this price as the minimum where desirable quantities are involved. More activity is seen in sheets, but prices have failed to advance. There have been some good sales of pig iron, including one of 13,000 tons of Lebanon low phosphorus. Furnace coke is firmer. The best that is said of old materials is that they are no weaker. Relief in the ferromanganese situation is believed to be in sight.

Iron Ore.—No arrivals occurred at this port last week.

Pig Iron.—The situation is unquestionably better. Though increased activity in buying was not widespread in the week just ended, it enabled some sellers to make a better showing than for some time. The leading individual transaction was the taking of 13,000 tons of Lebanon low phosphorus by a consumer in the Eastern market. The price was not given for publication, but it is stated to have been satisfactory to the seller; in fact, was considered good. Cast-iron pipe makers in this vicinity and in Virginia have taken some iron, but details are not forthcoming as yet. One estimate has it that Virginia pipe works have bought 20,000 tons, about equally divided between Southern and Virginia furnaces, perhaps one-half having been negotiated through Philadelphia channels. Local consumers have taken at least 2000 tons of Southern iron. A Baltimore interest has an inquiry out for about 2000 tons of foundry iron, including both Northern and Southern. Interest in basic is shown in new quarters, though the quantities involved are not large for steel-making iron. An eastern Pennsylvania steel company has sounded the market for 3000 tons and there are reports that a Harrisburg company is receptive as well. Transactions of the past few days include 500 to 600 tons of gray forge taken by a nearby mill at between \$13.25 and

\$13.50, delivered, and 1200 tons of charcoal iron contracted for by a carwheel manufacturer, on the basis of \$15.75, Buffalo. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

| | |
|---------------------------------|--------------------|
| Eastern Penna. No. 2 X, foundry | \$14.25 to \$14.50 |
| Eastern Penna. No. 2 plain | 14.00 to 14.25 |
| Virginia, No. 2 X, foundry | 15.25 |
| Virginia No. 2 plain | 15.00 |
| Gray forge | 13.25 to 13.50 |
| Basic | 13.25 to 13.50 |
| Standard low phosphorus | 20.00 to 20.50 |

Ferroalloys.—In the week ended April 24 only 100 tons of 80 per cent. ferromanganese arrived at this port from England, but definite advices have been received that fairly large shipments will be here by the end of the month. Practically all that arrives will be needed against existing contracts, though in some cases sales have been made at \$78, seaboard, where the consumer will take a certain amount of spot and the remainder of his order in later months. Annoyance is being caused by the strict attitude of the British Government in cases where consumers' guarantees (devised to guard against reshipment abroad of ferromanganese in any form) were signed by other than the chief executive of a purchasing company. If signed by a purchasing agent or treasurer, etc., the documents are returned. The market for 50 per cent. ferrosilicon continues at \$71 to \$73, Pittsburgh.

Bars.—The demand for twisted and deformed concrete reinforcing bars is below normal for the season. At the same time a quickening tendency has been noticed of late. Inquiries for ordinary steel bars are not noteworthy. They are quoted at 1.359c., Philadelphia, second half delivery. Iron bars are firmer at 1.15c. to 1.20c., Philadelphia. An order for 500 tons of angle bars has been placed with the Pennsylvania Steel Company by the Atlantic Coast Line Railroad.

Plates.—Makers report that the run of miscellaneous orders holds up in a satisfactory way. The mills now have in hand not only inquiries from the Pennsylvania Railroad but also from car and locomotive companies now figuring on building part of the equipment which the railroad will have built outside of its own shops. Most makers quote 1.359c. Philadelphia (1.20c., Pittsburgh) for second quarter delivery but in one or two instances makers say they have not been able to get this price.

Rails.—The Pennsylvania Railroad has sent out fresh inquiries for quotations on its 1915 rail requirements, although it was understood that this phase of its contemplated purchasing was past. The Pennsylvania Steel Company will roll 600 tons of girder rails to fill small orders.

Structural Material.—New projects of attractive size in this vicinity are few. They are more numerous, however, both here and elsewhere, and representatives of fabricating companies say the aggregate tonnage on which they are estimating reaches a fair figure. Though it is firmly sought to get 1.359c. Philadelphia, or 1.20c., Pittsburgh, on all new propositions, it is admitted that five points less might be drawn out by an attractive job. Bids are to go in May 3 on the 400 to 500 tons for the Hickok Mfg. Company's plant extension at Harrisburg.

Sheets.—The market is more active because of the demand from automobile manufacturers and others. Less is heard of intrusion into this market by a new Western maker which cut deeply into prices to get business. It is now understood to be sold up. The quotations for No. 10 blue annealed sheets are 1.459c. to 1.509c., Philadelphia.

Billets.—Some additional export inquiries have been received. It has been asserted in the case of some of these that the prices quoted were satisfactory to the intending purchaser, but the business has been halted by the scarcity of cargo space in transatlantic ships. The quotation for open-hearth rolling billets is \$22.02, Philadelphia, based on \$19.50, Pittsburgh, with an extra of \$4 to \$5 per ton for forging steel.

Coke.—Furnace coke is in better demand and quotations have a stronger tone. Much higher prices are

looked for with the approach of summer weather. Quotations for prompt delivery, Connellsville furnace coke, are \$1.55 to \$1.65 per net ton at oven. Contract furnace to December 31 is quoted at \$1.75. Prompt foundry ranges from \$2 to \$2.35 and contract foundry at \$2.20 to \$2.35. Freight rates from the principal producing districts are as follows: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—Sales of a few moderate-sized lots of heavy melting steel are said to have been made at \$11.50, but as a rule \$11.25 is asserted to be the maximum price. The demand is largely hand-to-mouth, but the market certainly is no weaker and confidence is not impaired. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

| | |
|--|--------------------|
| No. 1 heavy melting steel..... | \$11.00 to \$11.25 |
| Old steel rails, rerolling..... | 11.50 to 12.00 |
| Low phosph. heavy melting steel scrap..... | 14.25 to 14.50 |
| Old steel axles..... | 14.00 to 14.50 |
| Old iron axles..... | 17.50 to 18.00 |
| Old iron rails..... | 14.00 to 14.50 |
| Old carwheels..... | 11.00 to 11.50 |
| No. 1 railroad wrought..... | 12.75 to 13.25 |
| Wrought-iron pipe..... | 10.00 to 10.50 |
| No. 1 forge fire..... | 8.00 to 8.50 |
| Bundled sheets..... | 9.00 to 9.50 |
| No. 2 busheling..... | 7.75 to 8.25 |
| Machine shop turnings..... | 8.25 to 8.75 |
| Cast borings..... | 8.00 to 8.50 |
| No. 1 cast..... | 11.75 to 12.25 |
| Grate bars, railroad..... | 8.75 to 9.25 |
| Stove plate..... | 8.75 to 9.25 |
| Railroad malleable..... | 9.00 to 9.50 |

Buffalo

BUFFALO, N. Y., April 27, 1915.

Pig Iron.—With the exception of one good sized lot of foundry iron wanted for delivery over the last half only a very small volume of inquiry is reported for the week with but a moderate total of business placed, comprised principally of filling in orders. Although the general structure of the business fabric appears to be gradually strengthening, many of the iron and steel industries of the district which are not specially benefited by war supply orders are very dull, and some manufacturers who usually take large annual tonnages are for the present taking only limited amounts of iron from furnaces. Charcoal iron continues to be an active feature, and sales in that line are of good volume. The price situation remains unchanged, the majority of the furnace interests quoting prices ranging from \$13 for the lower grades of foundry iron to \$13.25 for No. 1 foundry, with \$13.50 to \$13.75 for the higher silicon specialties, delivery running through the last half. There is very little demand for malleable, with \$13 at furnace the minimum price. The 6000 tons of malleable iron reported as placed in the Buffalo district last week went to a Pennsylvania furnace interest.

Finished Iron and Steel.—The price for bars, shapes and plates for delivery through the remainder of the second quarter is strongly held at 1.20c., Pittsburgh base. Mills are still reluctant to quote on third quarter business, preferring to wait at least until the middle of May before booking much tonnage for that period. In many instances considerable pressure is being brought by consumers to secure early deliveries of bar material, indicating that their stocks were now low. Some mills are having difficulty in satisfying customers on the quick shipments they are asking for. Inquiry for railroad spikes and other track supplies is quite active. The Great Lakes Dredge & Dock Company, Buffalo, was low bidder for a dock and retaining wall to be built by the city of Buffalo which will require a considerable quantity of steel for drift bolts and concrete reinforcement. Bids for a large tonnage of concrete reinforcing bars and 480 tons of structural steel required for the Ford Motor Company's new service building in this city are to be opened on Friday of this week. Bids are being taken for a studio building to be erected in Rochester by F. L. Greeno and associates requiring about 200 tons of steel. The Lackawanna Bridge Company, Buffalo, has contract for the structural steel required for the Sheephead Bay race track

near Coney Island, involving about 4000 tons. The same company also has contract for steel for factory addition for the New Process Gear Company, Syracuse, 100 tons. The E. K. Fenno Company, Syracuse, has contract for the Brewster-Gordon Company warehouse, Rochester, calling for 250 tons of reinforcing bars. The J. Henry Miller Company, Miller Building, Baltimore, Md., has been awarded the general contract for the Lehigh Valley passenger station and terminal, Buffalo, involving a large tonnage of structural steel.

Old Material.—The demand for heavy melting steel continues and some large sales have been made to local consumers at a range of \$10.50 to \$11, Buffalo, the maximum being 25c. over the top price paid last week. The demand for cast borings was also fairly good, but an oversupply with some dealers caused a decline of 25c. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

| | |
|--|--------------------|
| Heavy melting steel..... | \$10.50 to \$11.00 |
| Low phosphorus steel..... | 13.00 to 13.50 |
| No. 1 railroad wrought scrap..... | 10.00 to 10.50 |
| No. 1 railroad and machinery cast..... | 10.50 to 11.00 |
| Old steel axles..... | 12.00 to 12.50 |
| Old iron axles..... | 16.00 to 16.50 |
| Old carwheels..... | 10.50 to 11.00 |
| Railroad malleable..... | 9.50 to 10.00 |
| Machine shop turnings..... | 5.75 to 6.25 |
| Heavy axle turnings..... | 8.50 to 9.00 |
| Clean cast borings..... | 6.50 to 6.75 |
| Old iron rails..... | 11.00 to 11.50 |
| Locomotive grate bars..... | 9.00 to 9.50 |
| Stove plate (net ton)..... | 8.25 to 8.75 |
| Wrought pipe..... | 6.50 to 7.00 |
| Bundled sheet scrap..... | 7.25 to 7.75 |
| No. 1 busheling scrap..... | 8.50 to 9.00 |
| No. 2 busheling scrap..... | 6.00 to 6.50 |
| Bundled tin scrap..... | 9.00 |

Cleveland

CLEVELAND, OHIO, April 27, 1915.

Iron Ore.—Following the establishment of the season's prices on Lake Superior ores on the same basis as a year ago considerable tonnage has been booked by consumers, most steel companies having long-time contracts, and some of the reservations that were made recently have been written in the contracts. Sales to merchant furnaces so far have been light. However, the market has opened with more activity than it did a year ago, and while an active buying movement is not expected in the near future dealers are looking for a better season than during 1914 and a considerable increase in shipments as compared with a year ago. Steel companies affiliated with ore-selling agencies and mining companies generally have large stocks of ore on hand, but those that have closed contracts are specifying for as much tonnage as a year ago. It is uncertain how much Lake Superior ore dealers will be able to dispose of to Eastern blast furnaces and steel companies. Most of the Eastern consumers at present have large stocks of ore on hand, in some cases enough to last six months and will not make any additional purchases for some time. With the high ocean rates prevailing on account of the war and the uncertainty in securing shipments of foreign ore it is believed that if general business conditions in the steel trade improve later in the season the Eastern furnaces will take a fair volume of Lake Superior ore. Prices, which are firm, are as follows, delivered to lower Lake ports: Old range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; old range non-Bessemer, \$3; Mesaba non-Bessemer, \$2.85.

Pig Iron.—The United Steel Company, Canton, Ohio, has purchased 30,000 tons of basic iron for delivery during the remainder of the year, this tonnage being divided between a nearby and a Cleveland furnace. The Central Steel Company, Massillon, Ohio, which will start up its new open-hearth steel plant in about 30 days, is in the market for its basic requirements. At the start this plant will consume about 3000 tons of basic pig iron per month. There is a moderate volume of business coming out in small lots of foundry iron which is quoted at \$12.50 to \$12.75, Valley furnace, for No. 2, and the same price in Cleveland for outside shipments. The largest inquiry pending is from a Canton consumer for 800 tons of Northern foundry for delivery during the remainder of the year. Southern iron is moving in

small lots, and two or three producers have advanced their price 25c. a ton to \$9.75, Birmingham, for No. 2 for the last half. For early delivery \$9.50 is the usual quotation. The improvement in the foundry melt is holding up well. We quote delivered Cleveland as follows:

| | |
|--|------------------|
| Bessemer | \$14.55 |
| Basic | 13.45 |
| Northern No. 2 foundry..... | \$13.25 to 13.50 |
| Southern No. 2 foundry..... | 13.50 to 13.75 |
| Gray forge | 13.00 |
| Jackson Co. silvery 8 per cent. silicon. | 16.37 to 16.62 |
| Standard low phos. at furnace..... | 19.75 to 20.00 |

Coke.—Consumers are feeling the market for prices on foundry coke contracts for the last half, and some business has been closed for that delivery and also for the entire year from July 1. We quote the best grades of Connellsville foundry coke at \$2.25 per net ton at oven for spot shipment and \$2.40 to \$2.50 for contracts. Furnace coke is held at \$1.50 to \$1.60 for prompt shipment and \$1.70 to \$1.75 for delivery during the remainder of the year.

Finished Iron and Steel.—Specifications in finished lines are coming out in good volume and mill agencies report that the actual orders booked during April will equal or exceed the tonnage of March, which was a very good month. Some steel bar contracts are being placed by the implement trade and other consumers at 1.25c. Pittsburgh for the third quarter and a few have been taken at 1.30c. for the fourth quarter. Sellers, however, are trying to avoid making contracts for those deliveries. Prices on steel bars are firm at 1.20c. Pittsburgh for the second quarter. A local mill is well filled with orders for 60 days. While the irregularity in plate prices has not disappeared, 1.15c. Pittsburgh is generally the minimum quotation. Considerable building work requiring small lots of structural material is in prospect. The Burger Iron Company, Akron, has taken 900 tons for a building for the Firestone Tire & Rubber Company, Akron, and there is an inquiry out for 600 tons for an extension to the plant of the Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio. The demand for bar iron is very dull and local mills are running largely on steel bars. We quote iron bars at 1.10c., Pittsburgh. The demand for sheets has improved somewhat but prices on galvanized sheets are very irregular, quotations for No. 28 ranging from 3.25c. to 3.60c. at mills. We quote black sheets at 1.75c. to 1.80c. for No. 28 and blue annealed at 1.30c. to 1.35c. Some third quarter contracts have been placed at \$2 a ton above prevailing prices. Warehouse prices are 1.80c. to 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—Specifications on bolts and nuts are very good and some new business in small lot orders is coming out. The volume of April business will show considerable improvement over the previous few months. The new demand for rivets is light. Prices are unchanged at 1.40c. to 1.45c., Pittsburgh, for structural and 1.50c. to 1.55c. for boiler rivets. Bolt and nut discounts are as follows: Common carriage bolts, $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 80 and 15 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 75 and 17½ per cent.; machine bolts with h.p. nuts, $\frac{3}{4}$ x 4 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 80 and 2½ per cent.; coach and lag screws, 85 and 2½ per cent.; square h.p. nuts, blank or tapped, \$6.40 off; hexagon h.p. nuts, blank or tapped, \$7.30 off; c.p.c. and t. square nuts, blank or tapped, \$6.10 off; hexagon, $\frac{3}{4}$ in. and larger, \$7.60 off; 9/16 and smaller, \$8.30 off; semi-finished hexagon nuts, $\frac{3}{4}$ in. and larger, 85, 10, 10 and 5 per cent.; 9/16 and smaller, 85, 10, 10, 10 and 5 per cent.

Old Material.—There is a moderate volume of business in the scrap market and prices on most grades are firm at about recent levels. Heavy melting steel scrap is about 25c. a ton higher in both Cleveland and Youngstown, and for shipment to the latter point is quoted at \$11.25 to \$11.50. A Cleveland mill has taken 1000 tons at \$10.40. Dealers are looking for better prices and are not disposed to sell short. Mills are well supplied for early requirements but are willing to buy

for future delivery. We quote, f.o.b. Cleveland, as follows:

| Per Gross Ton | |
|--------------------------------------|--------------------|
| Old steel rails, rerolling..... | \$11.00 to \$11.75 |
| Old iron rails | 12.00 |
| Steel car axles | 12.00 to 12.50 |
| Heavy melting steel | 10.25 to 10.50 |
| Old carwheels | 9.75 to 10.00 |
| Relaying rails, 50 lb. and over..... | 22.50 |
| Agricultural malleable | 8.00 to 8.50 |
| Railroad malleable | 10.00 to 10.25 |
| Steel axle turnings | 8.75 to 9.00 |
| Light bundled sheet scrap | 8.00 to 8.50 |

| Per Net Ton | |
|---------------------------------------|--------------------|
| Iron car axles | \$15.00 to \$15.50 |
| Cast borings | 6.00 to 6.25 |
| Iron and steel turnings and drillings | 5.50 to 5.75 |
| No. 1 busheling new | 8.50 to 8.75 |
| No. 1 busheling old | 8.25 to 8.50 |
| No. 1 railroad wrought | 9.50 to 9.75 |
| No. 1 cast | 9.75 to 10.25 |
| Stove plate | 7.75 to 8.00 |

Cincinnati

CINCINNATI, OHIO, April 28, 1915.—(By Wire.)

Pig Iron.—The activity in basic has proved one of the most interesting features of the market. Confirmation has been received from the American Rolling Mill Company of its purchase of 35,000 tons for last half shipment. Another melter has also covered for last half requirements, and it is rumored that all of the basic users in this territory who have not bought are in a receptive mood for offers on iron for future delivery. A report generally circulated probably overestimates the amount of Southern basic iron that has been bought by nearby concerns lately, but the tonnage is known to be large as compared with past records. This is attributed to the difference in the delivered cost, as compared with Northern basic, as well as to the receipt of a number of special orders for finished products in the manufacture of which iron of a different analysis can be used. Foundry iron consumers are also showing more interest in the market, and a number of contracts have been made quietly for last half shipment. Central Ohio furnishes two customers for 500 tons of Southern iron, while a southern Ohio melter bought 1000 tons of Southern No. 2. Approximately 3000 tons of both Northern and Southern iron has been purchased by a consumer at Springfield, Ohio. Inquiries include one from a nearby foundry for 1000 tons of Southern foundry, and a like tonnage of Northern foundry is wanted by a southern Ohio melter. Southern furnaces are making an effort to advance quotations. One large producer is now asking \$9.75, Birmingham, for either prompt or last half shipment, as against \$9.50 a week ago. Others have also made advances in asking prices, but \$9.50, Birmingham basis, can still be done for shipment through the year on several brands. Northern iron is weak, and \$12.50, Iron-ton, is quoted for either prompt or third quarter delivery. Malleable is very slow. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Iron-ton, we quote, f.o.b. Cincinnati, as follows:

| | |
|--|--------------------|
| Southern coke, No. 1 f'dry and 1 soft. | \$12.90 to \$13.40 |
| Southern coke, No. 2 f'dry and 2 soft. | 12.40 to 12.90 |
| Southern coke, No. 3 foundry..... | 11.90 to 12.40 |
| Southern No. 4 foundry..... | 11.40 to 11.90 |
| Southern gray forge | 10.90 to 11.40 |
| Ohio silvery, 8 per cent. silicon..... | 16.01 to 16.26 |
| Southern Ohio coke, No. 1..... | 14.76 to 15.26 |
| Southern Ohio coke, No. 2..... | 13.76 to 14.26 |
| Southern Ohio coke, No. 3..... | 13.51 to 13.76 |
| Southern Ohio malleable Bessemer..... | 14.01 |
| Basic, Northern | 14.01 |
| Lake Superior charcoal | 15.25 to 17.25 |
| Standard Southern carwheel | 26.90 to 27.40 |

(By Mail)

Coke.—A consumer in this territory has bought 35,000 tons of furnace coke for last half shipment. This is the first reported sale of any size around here for several weeks. The inquiry for approximately 8000 tons of gas coke, previously reported, is still open. Foundry coke is still dull, sales being principally carload lots for immediate use. We quote Connellsville foundry coke at \$2 to \$2.25 per net ton at oven, and for future shipment \$2.10 to \$2.50. Wise County is unchanged at \$2.25 to \$2.50.

Finished Material.—Specifications will probably be out soon for a large bridge to be built at Hamilton,

Ohio. Shipping instructions against contracts for reinforcing concrete bars are now quite active. Considerable new business is in sight, as compared with the last week in March. Prices on galvanized sheets are much firmer, due to the advance in spelter. The nearby mills are now quoting from 3.40c. to 3.50c., Pittsburgh, on No. 28, and are not trying to take any future business at this figure. No. 28 black sheets are unchanged at 1.80c. to 1.85c., Pittsburgh basis. Steel bars from warehouse stocks are unchanged at 1.80c., Cincinnati. Hoops and bands are a little more active. Hardware jobbers report a heavy demand for barb wire, poultry netting and wire nails.

Old Material.—Only a slight improvement in the demand is noted, which is principally from the rolling mills. The jobbing foundries continue to be good consumers of scrap, but they are not disposed to buy far ahead. The minimum figures given below represent what dealers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards.

Per Gross Ton

| | |
|------------------------------------|------------------|
| Bundled sheet scrap | \$6.25 to \$6.75 |
| Old iron rails | 10.50 to 11.50 |
| Relaying rails, 50 lb. and up..... | 19.25 to 19.75 |
| Rerolling steel rails | 9.75 to 10.25 |
| Melting steel rails | 8.50 to 9.00 |
| Heavy melting steel scrap | 8.50 to 9.00 |

Per Net Ton

| | |
|--------------------------------------|------------------|
| No. 1 railroad wrought | \$8.50 to \$9.00 |
| Cast borings | 4.50 to 5.00 |
| Steel turnings | 4.50 to 5.00 |
| Railroad cast scrap | 9.00 to 9.50 |
| No. 1 machinery cast scrap | 10.25 to 10.75 |
| Burnt scrap | 6.50 to 7.00 |
| Old iron axles | 13.50 to 14.00 |
| Locomotive tires (smooth inside).... | 8.50 to 9.00 |
| Pipes and flues | 5.75 to 6.25 |
| Malleable and steel scrap | 7.00 to 7.50 |
| Railroad tank and sheet scrap..... | 5.00 to 5.50 |

Birmingham

BIRMINGHAM, ALA., April 26, 1915.

Pig Iron.—It can be no longer doubted that the Birmingham iron market is on the upgrade. All furnace interests have participated in a liberal buying movement, which during the first three weeks of the month has reached a total of 200,000 tons. One company, with two active stacks, booked 40,000 tons; another, with two active stacks, 60,000 tons, while another, with an active productive monthly capacity of 60,000 tons, has sold more than its make. Still another has sold over 20,000 tons. The continued inquiry indicates a grand total of 250,000 tons for April. These sales cover present productive capacity well into the third quarter. One interest, which has sold 60,000 tons to the general trade, is at present on basic exclusively and consumes most of its basic output; hence its bookings mean a heavy drawing on accumulations. The outgo from the yards continues large. This is clearly indicated by Alabama car movements, which in March showed an increase over any month since last October. One of the most conservative manufacturers says: "For the first time this year the general foundry trade (exclusive of the big pipe works and similar interests) is on the active inquiry list and is making purchases. This is the most hopeful sign I have seen in months." As to prices, \$9.50 now seems to be the minimum, with \$9.75 secured for small lots. One large seller claims to have sold lots of 3000 and 5000 tons at \$9.75 covering the second half. The general quotation, however, for that period continues to be \$9.50. The effort to secure iron under \$9.50 appears to have subsided. One of the apprehensions in the Birmingham market now is that some iron purchased by speculators, of which it is known that there are two lots of 25,000 tons each, may be placed on the market later on when a \$10 basis is sought to be established. A Southern speculator was in the market during the week for 10,000 tons of iron, for which he offered \$9.50, and doubtless placed the order. Home consumption of basic iron is on the increase, both in rail mills and mills for the manufacture of nails and wire. We quote, per gross ton, f.o.b. Birmingham furnaces, for last half and fourth quarter as follows:

| | |
|-----------------------------|--------------------|
| No. 1 foundry and soft..... | \$10.00 to \$10.25 |
| No. 2 foundry and soft..... | 9.50 to 9.75 |
| No. 3 foundry | 9.00 to 9.25 |
| No. 4 foundry | 8.75 to 9.00 |
| Gray forge | 8.50 to 8.75 |
| Basic | 9.50 to 10.00 |
| Charcoal | 22.50 to 23.00 |

Cast-Iron Pipe.—The demand is strong, in fact unusually good for this period of the year. Orders are not often large ones, but they are coming from all over the country and amount to a considerable tonnage. A large export business could be done in pipe but for the lack of ship room. Sanitary pipe is holding its own on an improved basis, the demand from the West being especially good. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., \$20; 6-in. and upward, \$18, with \$1 added for gas pipe. It should be added that these prices are firm for the general run, but that where shops are short on special sizes desired a premium of about \$1 per ton is demanded.

Coal and Coke.—The domestic coal market has ceased for the summer but the railroad consumption is picking up. Coke is somewhat stronger, with shipments covering a wide range of foundry territory. One large pipe shop has changed to by-product coke and claims to be using it with great success. By-product coke sells at 35c. to \$1 per ton under beehive. We quote beehive coke, per net ton, f.o.b. oven, as follows: Furnace coke, \$2.75 to \$3; foundry, \$3 to \$3.25, with exceptionally good makes at \$3.40 to \$3.50.

Old Material.—The scrap market has become a trifle brisker, and prices tend to stiffen. However, sales are scattered, the principal betterment being in the stronger price tone. Stocks on hand are light. We quote, per gross ton, f.o.b. dealers' yards, as follows:

| | |
|-----------------------------|--------------------|
| Old iron axles | \$12.00 to \$13.50 |
| Old steel axles | 12.50 to 13.00 |
| Old iron rails | 12.00 to 12.50 |
| No. 1 railroad wrought..... | 8.50 to 9.00 |
| No. 2 railroad wrought..... | 7.50 to 8.00 |
| No. 1 country wrought | 8.00 to 8.50 |
| No. 1 machinery cast | 8.25 to 8.50 |
| No. 1 steel scrap | 8.00 to 8.25 |
| Tram carwheels | 8.25 to 8.50 |
| Stove plate | 7.00 to 7.50 |

Boston

BOSTON, MASS., April 27, 1915.

Old Material.—While prices have not been actually advanced the market is considerably stronger. Dealers agree that the general situation has improved. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. Mill prices are approximately 50c. per ton higher.

| | |
|--------------------------------------|------------------|
| Heavy melting steel | \$8.25 to \$8.50 |
| Low phosphorus steel | 13.75 to 14.75 |
| Old steel axles | 12.75 to 13.25 |
| Old iron axles | 20.25 to 20.75 |
| Mixed shafting | 12.00 to 12.25 |
| No. 1 steel wrought and soft steel.. | 8.25 to 8.75 |
| Skeleton (bundled) | 5.50 to 5.75 |
| Wrought-iron pipe | 7.00 to 7.50 |
| Cotton ties (bundled) | 5.25 to 5.75 |
| No. 2 light | 3.25 to 3.75 |
| Wrought turnings | 5.00 to 5.50 |
| Cast borings | 5.00 to 5.25 |
| Malleable | 7.50 to 7.75 |
| Stove plate | 7.00 to 7.50 |
| Grate bars | 5.25 to 5.50 |
| Machinery cast (price to consumers) | 11.25 to 11.50 |

St. Louis

ST. LOUIS, MO., April 26, 1915.

Pig Iron.—The demand is confined strictly to immediate and pressing needs, and sales are therefore of extremely small lots. On existing contracts pig iron is moving forward in accordance with allotments. No inquiries are pending except one for an indefinite amount of high silicon.

Coke.—No new business is appearing. By-product coke is quotable at about \$5.20 per net ton, delivered St. Louis.

Finished Iron and Steel.—New business continues to appear in small lots only and fabricators continue to prefer to take material from warehouse rather than contract ahead, thus paying a premium for prompt delivery. No railroads are in the market for material

at present, but there are well supported reports that they will be shortly. Agricultural and vehicle demand is quite satisfactory for the season. For material out of warehouse the prices, well held, with a free movement, are: Soft steel bars, 1.70c.; iron bars, 1.65c.; structural material, 1.80c.; tank plates, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, black sheet gauge, 3.75c.

Old Material.—The scrap market continues in a sagging condition. Quotations are for the most part strictly nominal as there is not sufficient business moving to establish prices. Embargos are the rule, and practically all the industries in this section have announced a determination not to purchase for from 30 to 90 days unless unforeseen conditions arise. Relaying rails have stiffened under new demand and are quotable at a higher figure—the only advance to be noted in the market. The only new list out is one of 2500 tons from the Burlington, bids closing April 29. We quote dealers' prices, f.o.b. St. Louis, nominally, as follows:

| Per Gross Ton | | |
|---|-------|--------------------|
| Old iron rails | ..... | \$10.25 to \$10.75 |
| Old steel rails, rerolling | ..... | 10.00 to 10.25 |
| Old steel rails, less than 3 feet | ..... | 10.75 to 11.25 |
| Relaying rails, standard section, subject to inspection | ..... | 21.75 to 23.00 |
| Old carwheels | ..... | 9.25 to 9.75 |
| No. 1 railroad heavy melting steel scrap | ..... | 9.00 to 9.50 |
| Shoveling steel | ..... | 8.50 to 9.00 |
| Frogs, switches and guards cut apart | ..... | 9.00 to 9.50 |
| Bundled sheet scrap | ..... | 5.75 to 6.00 |
| Per Net Ton | | |
| Iron angle bars | ..... | \$10.25 to \$10.75 |
| Steel angle bars | ..... | 8.00 to 8.50 |
| Iron car axles | ..... | 13.75 to 14.25 |
| Steel car axles | ..... | 10.00 to 10.50 |
| Wrought arch bars and transoms | ..... | 11.00 to 11.50 |
| No. 1 railroad wrought | ..... | 7.75 to 8.25 |
| No. 2 railroad wrought | ..... | 7.75 to 8.25 |
| Railroad springs | ..... | 8.25 to 8.75 |
| Steel couplers and knuckles | ..... | 8.25 to 8.75 |
| Locomotive tires, 42 in. and over, smooth inside | ..... | 8.75 to 9.25 |
| No. 1 dealers' forge | ..... | 7.00 to 7.50 |
| Mixed borings | ..... | 5.00 to 5.25 |
| No. 1 busheling | ..... | 7.25 to 7.75 |
| No. 1 boilers, cut to sheets and rings | ..... | 6.25 to 6.50 |
| No. 1 railroad cast scrap | ..... | 8.25 to 8.75 |
| Stove plate and light cast scrap | ..... | 6.75 to 7.25 |
| Railroad malleable | ..... | 6.00 to 6.50 |
| Agricultural malleable | ..... | 5.50 to 6.00 |
| Pipes and flues | ..... | 6.00 to 6.50 |
| Railroad sheet and tank scrap | ..... | 6.00 to 6.50 |
| Railroad grate bars | ..... | 6.50 to 7.00 |
| Machine shop turnings | ..... | 5.25 to 5.75 |

New York

NEW YORK, April 28, 1915.

Pig Iron.—No great amount of foundry iron has been bought in the past week. There are some inquiries, but not much is said of them in the trade. Apparently they represent efforts by several interests which did not cover at the low prices in the Buffalo movement to get in at something under what furnaces are asking in that district today. One large New York State interest in particular made inquiries after the low-priced selling was over. A furnace that did not participate largely in the movement of March has taken some business since at prices intermediate between \$12 Buffalo and those asked today. In Greater New York and New Jersey, foundries seem to be pretty well supplied with iron, and their interest now is in their coke contracts for delivery beginning July 1. Some of this business is under negotiation. A factor in the Buffalo situation is the speculative purchase of 50,000 tons of No. 2 X iron at \$12, though it is understood this iron will be held for a better price than now prevails. Some sellers of Southern iron in Eastern territory find their principals rather firmer in their views, as indicated by instructions to advise with the producers before making further sales at prices recently quoted. The supply of Virginia iron is increased by the blowing in of Low Moor furnace last week. The price in Virginia seems pretty well fixed at \$12.50 at furnace for No. 2 X. The ore situation is of some interest to eastern Pennsylvania furnaces in view of the limitations on the Swedish ore supply and the higher freights on Cuban ores. Eastern ores which sold at 6½c. and 6¾c. per unit in the past year are cheaper than Lake Superior ores, even with the continuance of the low prices of last year. The latter would figure out 7½c. per unit or

more, delivered in the Lehigh and Schuylkill valleys. In view of the cutting down of ore imports, it is likely that the driest of the high-grade Lake ores will find a place in Eastern mixtures to a somewhat greater extent than was the case last year. We quote as follows, at tidewater: No. 1 foundry, \$14.25 to \$14.50; No. 2 X, \$14 to \$14.25; No. 2 plain, \$13.75 to \$14; Southern iron, \$14.50 for No. 1 and \$14 to \$14.25 for No. 2.

Ferroalloys.—Receipts of ferromanganese are reported at various Atlantic ports under the recent temporary lifting of the British embargo. The metal is being distributed only to consumers who recently merged their contracts. The total so far received is estimated at about 1500 tons, with other boats near port. This is exclusive of 1000 tons received in March under special arrangement for the use of an Eastern steel maker. It is not believed that much spot material is available, the little that can be obtained being sold at about \$100 seaboard. The quotation for ferromanganese still remains \$78, seaboard. Spiegeleisen is quoted at \$26 for 19 to 21 per cent. metal. The usual business, both domestic and foreign, is being transacted in 50 per cent. ferrosilicon at \$71 to \$73 Pittsburgh.

Structural Material.—The awarding in the last week of 16,860 tons of structural steel for New York subway construction to the American Bridge Company brings the total for this market for April to at least 50,000 tons, which is regarded quite favorably. While the total for March was over 100,000 tons, April's aggregate is better than the monthly average for nearly a year. The two subway contracts referred to are 12,000 tons for section 2, route 12, of the eastern parkway subway, and 4860 tons for section 4 of the Broadway subway, that comprised on Seventh avenue between Fifty-first and Fifty-ninth streets, for which the Litchfield Contracting Company is the general contractor. There is an absence of large projects in this market, but the prospect for small undertakings is reported good and it is expected that May will see many of these up for bids. The last week in April shows about 18,000 to 20,000 tons still awaiting awards. In the last week the Passaic Steel Company has taken 1100 tons for the Axlerod apartments at Eighty-first street and Broadway, and 700 tons for a loft building at Thirtieth street and Broadway. Other contracts awarded are as follows: 600 tons for the upper deck of the Manhattan Bridge to the Vulcan Iron Works; 1000 tons for the Eagle Pencil Company, East Thirteenth street to the William B. Shafer Company, Inc.; 200 tons for alterations to the Metropolitan Life Insurance Building, to Milliken Brothers; 300 tons for a shed for Pier No. 7 for the Central Railroad of New Jersey to Louis F. Shoemaker & Co. It is understood that the fabricating of 1600 tons for the track of the Sheepshead Bay motor-drome has been taken by the Lackawanna Bridge Company and that 3000 tons for the grandstand is still to be awarded. The general contract for the 1500 tons for the Lehigh Valley at Buffalo goes to J. Henry Miller of Baltimore. The 1000-ton warehouse for Brewster, Gordon & Co., at Rochester, N. Y., is to be built of concrete instead of steel. Bids are to go in this week for the 1000 tons for the Boston & Maine at Bardwell, Mass. The New York Central is inquiring for 300 tons of steel for three bridges and the Central Railroad of New Jersey for 500 tons for one bridge, and bids are being asked on 1000 tons for the Degnon office building. We quote mill shipments at 1.20c., Pittsburgh, or 1.369c., New York, and from store, 1.85c. to 1.90c., New York. It is admitted that a large tonnage would secure a price concession.

Plates.—Considerable foreign inquiry for plates has recently appeared in this market, mostly shipbuilding plates, much of it for England. It has not yet resulted in orders because freight rates have been prohibitive. These are reported to be easier now and there is more probability of some business being closed. Plates in England are quoted above \$47 f.o.b. port, as against about \$28 at New York; this should permit of some business being done. The Pennsylvania Lines West have increased their inquiry for cars from 6400 to 6900, asking for 3000 box cars instead of 2500. This makes a total for this road of 15,050 freight cars on which bids were to be taken April 28, apart from what it is

to build for itself. In the week contracts have been awarded to the American Car & Foundry Company for 300 gondolas for the St. Louis, Troy & Eastern and for 100 subway cars for the New York Municipal Railway. Besides these the Standard Steel Car Company will build 10 hopper cars for the Pittsburgh Steel Company. The Pennsylvania Lines West divided an order for 150 steel underframes between the Ralston Steel Car Company and the Greenfield Car Company of Greenfield, Pa. Reports that the Rock Island is inquiring for 5000 cars and the Minneapolis and St. Louis for 1000 cars cannot be confirmed here. Local business in plates is dull. While the 1.20c. Pittsburgh price is being asked for small lots, it is admitted that desirable specifications would bring out a 1.15c. quotation or less. We quote steel plates at 1.15c. to 1.20c., Pittsburgh, or 1.319c. to 1.369c., New York, and from store, 1.85c. to 1.90c., New York.

Iron and Steel Bars.—Domestic business is still slack. Prices, however, remain firm, owing to the export situation, inquiries from that quarter still being numerous. Bar-iron business placed in the week is reported to have kept pace with the volume maintained the past two months, business for April being reported as probably being equal to that for March. We quote mill shipments of steel bars at 1.20c., Pittsburgh, or 1.369c., New York, and refined iron bars 1.20c. to 1.25c., New York. Out of store in New York we quote iron and steel bars at 1.80c. to 1.85c.

Cast-Iron Pipe.—On Wednesday, May 5, the Department of Water Supply, Gas and Electricity of the city of New York will open bids on 880 tons of 8-in. water pipe for the borough of Manhattan. This appears to be the only municipal letting of importance in sight. A great deal of private buying is in progress, the volume being considerably larger than usual at this time. Export inquiries are steadily appearing, but satisfactory financial arrangements are still a bar to the closing of contracts. It is believed that the situation in this respect will soon be clearer. The recent advance in prices is maintained. Carload lots of water pipe, class B and heavier, are quoted at \$22 to \$22.50 per net ton, tidewater, for 6-in., with class A and gas pipe commanding an extra of \$1 per ton.

Old Material.—Conservatism continues to govern the large consumers of scrap. The steel companies in eastern Pennsylvania are purchasing little, if any, old material and continue to advise dealers to be moderate in filling contracts. On the other hand, dealers are themselves disposed to be cautious in making deliveries because of severe inspection by consumers who are quick to make rejections if a pretext presents itself. Rolling mills are almost completely out of the market, their operations being at a low rate. Brokers' quotations to local dealers and producers, per gross ton, New York, are continued as follows:

| | | |
|-----------------------------|-----------|--------|
| Old and T rails for melting | \$8.50 to | \$9.00 |
| Heavy melting steel scrap | 8.50 to | 9.00 |
| Relaying rails | 19.00 to | 19.50 |
| Re-rolling rails (nominal) | 9.25 to | 9.75 |
| Iron car axles (nominal) | 15.25 to | 15.75 |
| Steel car axles (nominal) | 11.75 to | 12.25 |
| No. 1 railroad wrought | 10.25 to | 10.75 |
| Wrought-iron track scrap | 9.50 to | 9.75 |
| No. 1 yard wrought, long | 9.50 to | 9.75 |
| No. 1 yard wrought, short | 8.50 to | 8.75 |
| Light iron | 3.25 to | 3.75 |
| Cast borings | 5.50 to | 5.75 |
| Wrought turnings | 6.00 to | 6.25 |
| Wrought pipe | 7.50 to | 8.00 |

Foundries are doing little in the scrap market, their business being considerably under normal. Old car-wheels have latterly become somewhat more active, brokers having purchased fair quantities from railroad companies in this vicinity. Quotations to consumers on cast scrap are as follows, per gross ton, New York:

| | | |
|-----------------------------|-----------|--------|
| Carwheels | \$9.00 to | \$9.25 |
| No. 1 heavy cast, broken up | 11.00 to | 11.25 |
| Stove plate | 8.00 to | 8.25 |
| Locomotive grate bars | 7.50 to | 8.00 |
| Malleable cast (railroad) | 8.00 to | 8.25 |

The Ayer & Lord Tie Company, Chicago, has received an order from the Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa., for 5000 yd. of interior wood floor block, and one from the National Electric Welding Company, Warren, Ohio, for 2000 yd.

British Market Tending Upward

Embargo Lowers Pig Iron—South African Rails to Canadian Mills

(By Cable)

LONDON, ENGLAND, April 28, 1915.

The pig-iron market is more settled because exports are prohibited except under license. Cleveland furnacemen regard the prohibition as wholly vexatious. Meantime shipments are suspended while representations are being made to the Government. The furnaces in blast are 164, against 168 a year ago. Stocks of pig iron in Connal's stores were 140,298 tons at the close of last week, against 136,386 tons one week previous. The British output of pig iron for 1914 was 9,005,898 tons. The German output for March is reported as 938,438 metric tons.

Semi-finished and finished steel are firm, but the market is tending upward. General conditions are unchanged. The demand for tin plates is small, but the market is advancing because some of the Welsh steel plants are expected to be taken over for Government work, which will further reduce the output of sheet bars for local use. The South African rail order was divided between the Algoma Steel Corporation and the Dominion Iron & Steel Company at £6 (\$29.20) f.o.b. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 17s. 4½d. (\$4.23), against 17s. 1½d. (\$4.17) last week.

Cleveland pig-iron warrants, 65s. 4d. (\$15.90), against 65s. 10d. (\$16.02) last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 65s. (\$15.82), compared with 65s. 9d. (\$16.00) a week ago.

Steel black sheets, No. 23, export, f.o.b. Liverpool, £11 5s. (\$54.75), against £11 (\$53.53) a week ago.

Steel ship plates, Scotch, delivered local yards, £9 15s. (\$47.44).

Steel rails, export, f.o.b. works port, £8 (\$38.93).

Hematite pig iron, f.o.b. Tees, 105s. (\$25.55).

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 (\$34.06).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £9 10s. (\$46.23).

Steel bars, export, f.o.b. Clyde, £10 (\$48.66), against £9 17s. 6d. (\$48.05).

Ferromanganese, f.o.b., £15 10s. (\$75.42).

Ferrosilicon, c.i.f., £14 (\$68.13).

Metal Market

NEW YORK, April 28, 1915.

The Week's Prices

Cents Per Pound for Early Delivery

| Apr. | Lake | Electro-lytic | Tin, New York | Lead | | Spelter | |
|------|-------|---------------|---------------|----------|-----------|----------|-----------|
| | | | | New York | St. Louis | New York | St. Louis |
| 21 | 20.50 | 17.62½ | 44.00 | 4.20 | 4.10 | 12.00 | 11.75 |
| 22 | 21.00 | 17.75 | 42.00 | 4.20 | 4.10 | 12.50 | 12.25 |
| 23 | 21.00 | 17.87½ | 42.00 | 4.20 | 4.10 | 12.75 | 12.50 |
| 24 | 21.00 | 17.87½ | 42.00 | 4.20 | 4.10 | 13.12½ | 13.00 |
| 26 | 21.00 | 18.37½ | 42.00 | 4.20 | 4.10 | 13.62½ | 13.50 |
| 27 | 21.00 | 18.62½ | 42.00 | 4.20 | 4.10 | 14.00 | 13.75 |

Copper is higher under the pressure of war demand. Tin is lower with spot metal nominal. Lead is quiet at unchanged prices. Spelter has again advanced sharply. The high prices of antimony are maintained.

New York

Copper.—There has been a good business in copper so far as the deliveries required can be made. Prime brands of Lake are unquestionably well sold up to August, while it seems highly probable that the output of electrolytic is sold up to June. For choice brands of Lake premiums are willingly paid and it is to be assumed that what metal is available is held for the consumers who want it at almost any price. There are those who will pay up to 23c. for Calumet & Hecla, while prime brands command from 21c. to 22c., cash, New York. Arsenical copper is quoted at 20c. Electrolytic is now quoted at 18.62½c., cash, New York, but not much business has been done since the price reached 18.50c., 30 days delivered, or 18.37½c., cash.

The exports this month total 14,478 tons. The regular domestic consumption of copper is estimated as being about 60 per cent. of normal, which is an improvement over recent months.

Tin.—In the past few days there has been a little more activity in futures, for which low prices were made, but the market for spot metal has been almost entirely nominal. Several ships have arrived from the Far East with large quantities aboard which brought the total of arrivals up to 3665 tons. Most of this metal is not out of the vessels yet, but the fact that it was here served to ease the market and bring spot down to 42c. It is pointed out that most of this tin will be needed to fill old contracts and that the relief it affords will be but temporary. The trade is greatly hampered by the regulations and restrictions which Great Britain is imposing, as the filling out of the necessary agreements is far from a mere formality. There is now afloat 3310 tons, 725 tons of which are Banca tin.

Lead.—The domestic market is quiet, but London shows more strength. The market there to-day is quoted at £21 5s., equal to about 4.57½c., New York, a figure which just about permits exports from this country on a profitable basis. It has been suggested, though in no way confirmed, that the recent break in London was due to manipulation designed to enable certain interests to buy at a lower price than had been prevailing. Domestic buyers are proceeding very slowly. The New York quotation is 4.20c., and that of St. Louis, 4.10c., the latter price being made by independent producers.

Spelter.—On Monday and Tuesday of this week spelter advanced £5 10s. in London, which served to accentuate an already advancing market here, and yesterday 14c., New York, and 13.75c., St. Louis, was asked for spot metal. On the floor of the New York Metal Exchange yesterday 100,000 lb. of May spelter was sold in two lots of 50,000 lb. each at 13.25c. and 13c., on bids. It is well understood that producers of choice brands are sold up to November. In the past few days galvanizers have shown more interest but the main demand is for the higher grades used in the manufacture of war munitions. Exports this month total 4449 tons.

Antimony.—The market continues exceedingly strong. For Chinese and Japanese 27c. to 28c. is asked. If Cookson's can be found it will be taken at 35c. and Hallett's at 32c., but these English brands are practically out of the market.

Old Metals.—The market has grown more active and prices are again higher. Dealers' selling quotations are as follows:

| | Cents |
|--|----------------|
| Copper, heavy and crucible..... | 17.00 to 17.50 |
| Copper, heavy and wire..... | 16.50 to 17.00 |
| Copper, light and bottoms..... | 14.00 to 14.50 |
| Brass, heavy..... | 11.00 to 11.50 |
| Brass, light..... | 8.50 to 9.00 |
| Heavy machine composition..... | 13.25 to 13.75 |
| No. 1 yellow rod brass turnings..... | 10.25 to 10.75 |
| No. 1 red brass or composition turnings..... | 11.00 to 11.25 |
| Lead, heavy..... | 3.75 |
| Lead, tea..... | 3.50 |
| Zinc, scrap..... | 8.00 |

Chicago

APRIL 26.—Prices for copper and spelter continue to soar, zinc quotations on actual demand are appreciably higher, and the nominal figures for Cookson's antimony, of which practically none can be had, also show an advance. The expected slump in tin quotations has been realized. We quote as follows: Casting copper, 18c.; Lake copper, 18.50c., for prompt shipment; small lots, ¼c. to ½c. higher; pig tin, carloads, 41c., small lots, 43c.; lead, desilverized, 4.12½c., and corroding, 4.35c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, nominally, 13¼c.; sheet zinc, 14.50c., or price ruling date of shipment; Cookson's antimony, 34c., for cask lots; other grades, 26.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 14c.; copper bottoms, 13c.; copper clips, 13.75c.; red brass, 11.50c.; yellow brass, 10c.; lead pipe, 3.375c.; zinc, 8.25c.; pewter, No. 1, 27c.; tinfoil, 32c.; block tin pipe, 37c.

St. Louis

APRIL 26.—The market for non-ferrous metals has been very irregular, all being decidedly uncertain when it comes to actual transactions. The best available figures at the moment are: Lead, 4.25c.; spelter, 14¼c.; tin, 44c.; Lake copper, 19c.; electrolytic copper, 18.50c.; antimony, 35c. In the Joplin ore district the zinc blende market was \$5 to \$8 per ton stronger than the previous week and the highest price paid for jack on the 60 per cent. metal basis, plus premium, was \$68 per ton. The basis range was \$58 to \$65. Calamine sold for \$34 to \$40, with the choicest ores reaching as high as \$48. Lead ore was unchanged at \$51 for 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 9c.; heavy yellow brass, 10c.; heavy red brass and light copper, 12.50c.; pewter, 25c.; tinfoil, 35c.; zinc, 9c.; lead, 3.60c.; tea lead, 3.25c.

Iron and Industrial Stocks

NEW YORK, April 28, 1915.

The buoyancy in the stock market continued with unflagging strength for the greater part of the past week, and quite a number of stocks made new high records for this movement. The feeling of confidence in the business situation is becoming decidedly more pronounced. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

| | |
|--|---------------------------------|
| Allis-Chal., com., 15 - 18 | Nat. En. & St., com., 14½ - 15½ |
| Allis-Chal., pref., 50½ - 53 | Nat. En. & St., pref., 85 |
| Am. Can, com., 34½ - 40 | Pressed Stl., com., 43½ - 51 |
| Am. Can, pref., 97½ - 99½ | Pressed Stl., pref., 95½ - 98 |
| Am. Car & Fdy., com., 53 - 55½ | Ry. Spring, com., 30 - 33½ |
| Am. Car & Fdy., pref., 114½ - 115½ | Republic, com., 27½ - 30½ |
| Am. Loco., com., 51½ - 58½ | Republic, pref., 85½ - 87½ |
| Am. Loco., pref., 93 - 97 | Rumely Co., com., 3½ - 4½ |
| Am. Stl. Fdries., 34 - 36½ | Rumely Co., pref., 9 - 10 |
| Bald. Loco., com., 47½ - 54½ | Sloss, com., 36½ - 39½ |
| Bald. Loco., pref., 101½ - 102 | Pipe, com., 13½ - 14 |
| Beth. Steel, com., 140½ - 150½ | U. S. Steel, com., 56½ - 59½ |
| Beth. Steel, pref., 110½ - 111½ | U. S. Steel, pref., 108½ - 109½ |
| Colorado Fuel, 31½ - 34½ | Va. I. C. & Coke, 42 |
| Deere & Co., pref., 88½ | West'ghse Elec., 82½ - 87½ |
| General Electric, 152½ - 154½ | Am. Ship, com., 70½ - 70½ |
| Gt. No. Ore Cert., 37 - 39½ | Am. Ship, pref., 70½ - 70½ |
| Int. Harv. of N. J., com., 103½ - 106½ | Chic. Pneu. Tool., 57 - 58½ |
| Int. Harv. Corp., com., 73 | Cambria Steel, 49½ - 50½ |
| Int. Pump, com., 6 - 10½ | Lake Sup. Corp., 7½ - 8½ |
| Int. Pump, pref., 14 - 23 | Pa. Steel, pref., 58½ - 60 |
| Lackawanna Stl., 39½ - 41 | Warwick, 9½ |
| | Cruc. Steel, com., 17 - 20½ |
| | Cruc. Steel, pref., 83 - 86 |
| | La Belle Iron, com., 30 |

Dividends

The United States Steel Corporation, regular quarterly, 1¼ per cent. on the preferred stock, payable May 29.

The American Brass Company, regular quarterly, 1½ per cent.

The Lackawanna Steel Company, regular quarterly, 1¼ per cent. on the preferred stock, payable June 1.

The Cambria Steel Company, regular quarterly, 1¼ per cent., payable May 15. This dividend, like those of the previous two quarters, is payable in scrip, bearing interest at 5 per cent. per annum.

The International Harvester Company of New Jersey, regular quarterly, 1¼ per cent. on the preferred stock, payable June 1.

The International Harvester Corporation, regular quarterly, 1¼ per cent. on the preferred stock, payable June 1.

The Warwick Iron & Steel Company, semi-annual, 3½ per cent., payable May 15.

The New Jersey Steel Company, Rahway, N. J., owning a steel casting plant, but which has done no business for about two years, has been placed in the hands of Dr. Charles H. Holcombe, Trenton, as receiver, on the application of the American Finance Company, Philadelphia. The Steel Company is in default in the payment of interest on its bonds.

The Bizier Welding & Cutting Company announces that business will be resumed on May 1, at 196 Eleventh avenue, New York City.

BRITISH STEEL EXPORTS

Shrapnel Bars to France—Steel Imports from the United States

Statistics of the imports and exports for the United Kingdom are now available through the month of March and furnish interesting data on the effect of the war.

The coal exports in the first seven months of 1914 amounted to 41,186,419 tons, exports in the following months, through March, constituting the first eight months of the war, being 29,073,187 tons, so that the monthly average decreased from 5,883,774 tons to 3,634,148 tons, or 38 per cent. The August exports were 3,070,742 tons and the March exports 3,977,273 tons, so that the trade has been increasing during the progress of the war.

After but a moderate decrease, due to the war, British iron ore imports have increased. The monthly average during the first seven months of 1914 was 516,649 tons, the monthly average during the eight months of war being 422,928 tons, or 18 per cent. less, but the March imports were 548,823 tons, or three per cent. more than the average before the war.

IMPORTS FALL OFF GREATLY

In iron and steel imports, on the other hand, there has been an enormous decrease, from an average of 209,040 tons per month during the last seven months of peace to 58,543 tons per month during the first eight months of war, a decrease of no less than 72 per cent. The March imports, however, were 76,588 tons, marking a substantial increase over the average in the preceding seven months of war.

The decreased imports were extremely large in the case of sheet bars, wrought iron bars and structural shapes. Blooms, billets and slabs have shown quite a different movement, within the war period, from sheet and tin-plate bars. In the last five months of 1914 both dropped in about the same proportion, roughly speaking, to very small proportions, but in the first five months of this year billets, etc., have shown a large increase, while sheet bars have shown a further decrease, to negligible proportions. Both classes of material had been imported chiefly from Germany and Belgium, but the supply thus shut off has been made up in considerable part by imports from the United States, particularly in the past three months, while in the case of sheet bars the mills have apparently not needed the material from any source. The divergence in the movement of the two classes of material has been so great that we present a detailed statement.

British Imports of Blooms, Billets, Slabs and Sheet and Tin-Plate Bars

| Monthly average. | Billets, etc. | Sheet bars. |
|---------------------------|---------------|-------------|
| First 7 months, 1914..... | 38,685 | 37,379 |
| Last 5 months, 1914..... | 5,588 | 3,305 |
| First 3 months, 1915..... | 18,206 | 834 |

No discussion of iron and steel movements is, of course, complete without a reference to shrapnel. There are no published statistics of shrapnel movements, but the raw material, the merchant steel bar, is given in both American and British statistics. It is reported that the allies in Belgium and France expect to shoot 200,000 shrapnel a day when the campaign is fully opened, and the demand for shrapnel has been insistent, the bars being purchased where they could be secured, and being finished into shells where the machinery could be found or installed. The crude material, therefore, seeks the finishing capacity, and while finished shells are being made in the United States, the plain rounds are also being exported. Exports of steel bars from the United States averaged 9678 gross tons per month during the first seven months of 1914, while they rose to 11,052 tons per month in the last five months of the year, and increased further to 17,933 tons in January and 20,225 tons in February. England evidently has required none of these bars, having an excess of bar making over finishing capacity. France, with 60 per cent. of her steel-making capacity in the hands of the enemy, but with many machine shops left, has been making shrapnel from imported bars, and

England has supplied by far the larger quantity. In the first seven months of 1914 British exports of steel bars to France were 409 tons per month, while in the next five months they were 2306 tons per month, and in the first three months of this year 23,653 tons per month, the March exports alone having been 26,934 tons. The British bar exports to other countries became insignificant in comparison, having been 17,867 tons a month in the first seven months of 1914 and dropping to 11,576 tons per month since then. The exports to Russia have been practically negligible.

MARCH EXPORTS SHOW INCREASES

The total British iron and steel exports averaged 402,823 tons per month during the first seven months of 1914, dropping to 228,256 tons a month in the following eight months, a decrease of 43 per cent. This change was due to lack of demand and of carrying facilities, not to lack of raw materials, as may be observed from the foregoing cursory sketch. The March exports were 239,342 tons, or 11 per cent. in excess of the January-February average.

The English supply of manganese ore has not been altogether poor by any means. The imports have been as follows:

| | Gross tons |
|-------------------------|------------|
| Year 1911..... | 358,915 |
| Year 1912..... | 387,738 |
| Year 1913..... | 601,207 |
| Seven months, 1914..... | 278,174 |
| Five months, 1914..... | 201,261 |
| Year 1914..... | 479,435 |
| January, 1915..... | 39,413 |
| February..... | 25,634 |
| March..... | 21,828 |

The monthly imports from January 1, 1911, to August 1, 1914, averaged 38,000 tons a month. The imports in the last five months of 1914 were at a rate 6 per cent. larger, while in the past three months they have been 24 per cent. smaller. When England has been in the past such a larger exporter of ferromanganese to the United States it is evident that her supplies of ore or alloy will accumulate if ore imports are continued on this scale and ferromanganese exports to the United States are not resumed on a fairly large scale.

Award of 150-Ton Crane for Norfolk Navy Yard

WASHINGTON, D. C., April 27, 1915.—The Secretary of the Navy has awarded to the Wellman-Seaver-Morgan Company, Cleveland, Ohio, the contract for the construction of the 150-ton floating revolving crane for the United States Navy Yard at Norfolk, Va., for which bids were opened on February 27. The awards were made after a hearing of representatives of the lowest bidder, the Wellman-Seaver-Morgan Company (\$323,750), the Bethlehem Steel Company (\$353,000) and the Morgan Engineering Company (\$381,985).

After careful consideration of the designs submitted by the seven bidders, who included the Cleveland Crane & Engineering Company, Wickliffe, Ohio (\$442,990); A. F. Smulders, of Schiedam, Holland (\$380,000); Shipbuilding & Engineering Company, Haarlem, Holland (\$400,000), and Neumeyer & Dimond, understood to represent the Deutsche Maschinenfabrik A. G., of Duisberg, Germany (\$439,500), it was decided that the department would not be justified in considering the bids of any foreign concern. Inasmuch, however, as the proposition of a 150-ton revolving floating crane was an entirely new one to the department experts, the designs of the lowest three American bidders were subjected to the closest possible scrutiny and comparisons were made upon the basis of complete equipment, including certain items not embraced in the original departmental design. The Wellman-Seaver-Morgan Company being the lowest bidder by nearly \$30,000 and its design being in all respects satisfactory, the award was accordingly decided upon soon after the hearing.

The purchase by the Isthmian Canal Commission of the floating crane Ajax, built by the Deutsche Maschinenfabrik A. G., Duisburg, Germany, was casually referred to at the hearing, but as there was in this case no issue between American and foreign bidders on the score of price, time of delivery or superiority of design, this phase of the subject was not elaborated. W. L. C.

PERSONAL

President James A. Farrell, of the United States Steel Corporation, leaves New York on Thursday of this week for a six weeks' trip to the Pacific coast. He will spend some time en route at Chicago and will then visit in turn the offices of the company at St. Paul and Winnipeg and will also go to Vancouver, Tacoma, Seattle and Portland, where the corporation has offices and warehouses. He will sail from San Francisco on May 26, returning to New York by way of the Panama Canal and arriving home about June 15.

At a meeting of the board of directors of the Woodward Iron Company of Birmingham, Ala., held in New York April 22, a change in the organization was made by the creation of the office of chairman of the board of directors. A. H. Woodward was advanced from vice-president and general manager to this new position. J. H. Woodward was re-elected president; R. S. Bannister was advanced from secretary to vice-president; D. E. Wilson was re-elected treasurer and Herbert E. Smith was elected assistant secretary. The office of secretary was not filled. A. H. Woodward, who takes the position of chairman, has been the operating head of the company for some years. He is perhaps the youngest manager of such important interests in the Birmingham district. His father, J. H. Woodward, has been president of the company from its organization.

John Birkinbine recently contributed to the Journal of the Franklin Institute an interesting paper on "Iron a Factor in the World's Progress." It discusses the relative positions of the leading countries that produce pig iron or supply the raw materials for its manufacture. The statistics included in the paper go back to 1870.

Z. T. K. Woo, superintendent of the Hanyehping Iron & Coal Company, of China, who has been in the United States for some time in connection with contracts for the building of two new blast furnaces by his company, was a speaker at the monthly meeting of the American Manufacturers' Export Association at the Hotel Biltmore, New York, April 21. He referred to China's need of American machinery and said that while it might cost more than that from some other countries there was a feeling that its advantages warranted the additional outlay.

L. F. Hamilton, in charge of the advertising and specialty department of the National Tube Company, Pittsburgh, has returned from an extended business trip to the Pacific coast, in connection with the exhibit at the Panama-Pacific Exposition of the National Tube Company, which is a part of the general exhibit of the United States Steel Corporation.

N. L. C. Kachelmacher, president Bessie Furnaces Company, New Straitsville, Ohio, has decided to retire from the active management on account of ill health. George S. Davison, Pittsburgh, who is financially interested in the company, has been made president; Allen S. Davison, treasurer, and Albert P. Meyer, secretary. Mr. Kachelmacher will remain as chairman of the board of directors. The offices of the company will be moved from Columbus, Ohio, to the Oliver Building, Pittsburgh, and the sales of the company's ferrosilicon will continue in the hands of the Allen S. Davison Company as sales manager, with offices in the same building. The general policy of the company will not be affected.

S. Le Fevre, formerly general manager and for the past two years general mining engineer of Witherbee, Sherman & Co., Mineville, N. Y., will open an office May 1 as consulting mining engineer at Forest Glen, Ulster County, N. Y. His connection with Witherbee, Sherman & Co., has covered a period of nine years, during which time extensive developments have been made in opening ore mines and erecting mills for the magnetic concentration of ores.

James I. Carr, general manager of the General Elec-

tric Company, Schenectady, N. Y., has been made a member of the Public Service Commission of the second district of the State of New York, succeeding Martin S. Decker, whose term recently expired. Mr. Carr had been connected with the General Electric Company for 15 years.

Thomas G. Thompson, a teacher-student in the chemistry department of the University of Washington, Seattle, has been honored with a Carnegie research fellowship of the Iron and Steel Institute. It is the first honor of this kind to be awarded in the United States for two years. Work to be prosecuted is on the protection of iron and steel from corrosion.

John Mitchell, president Morris Iron & Steel Company, Frederick, Md., has been made president of the Washington and Southern Bank, Washington, D. C.

P. H. Biggs has resigned as sales manager of Manning, Maxwell & Moore in the Cleveland territory and has taken an office in the Schofield Building, Cleveland, Ohio, under the name of the P. H. Biggs Machinery Company. He will handle machine tools and hydraulic machinery, representing a limited number of manufacturers in the northern Ohio territory.

At the annual meeting of the directors of the Edgar Zinc Company, St. Louis, Mo., held April 6, the following officers were elected for the ensuing year: S. C. Edgar, Jr., president; A. S. McMillan, vice-president and auditor, and W. B. Edgar, secretary and treasurer. On and after April 19 the general offices of the company will be located in suite 910, Boatmen's Bank Building, Broadway and Olive street, St. Louis.

E. C. Robertson, who, as a member of the staff of Carl G. Barth, has been engaged at the works of the H. H. Franklin Mfg. Company, Syracuse, N. Y., in connection with the installation of scientific management in that plant, has taken up work with the Universal Winding Company, Providence, R. I.

Charles H. Domhoff, Domhoff & Joyce Company, Cincinnati, Ohio, has returned to his home in Los Angeles, Cal., after a three weeks' visit to Cincinnati.

George D. Babcock, factory manager of the H. H. Franklin Mfg. Company, Syracuse, N. Y., is to deliver a series of lectures before the School of Commerce and Administration of Chicago University on May 12, 13 and 14.

G. H. Jones, vice-president Inland Steel Company, Chicago, will spend the month of May in California, the trip being largely for pleasure.

J. B. Arnold, in charge of structural and plate sales for the Illinois Steel Company at Chicago, has left for San Francisco, where he will represent the company the next two months at the Exposition.

Edward S. Moore, vice-president Chicago, Rock Island & Pacific Railroad, in charge of purchases, has resigned, effective May 1.

Hugh Kennedy, vice-president and general manager of the Rogers-Brown Iron Company, Buffalo, was painfully injured April 22 at the Susquehanna furnaces of the company, while conducting a number of visiting foundrymen through the plant. His foot caught on an obstruction while riding with the party on a stock larry and he was thrown from the car, sustaining severe lacerations and bruises. He was taken to a hospital and is making good progress toward recovery but will be laid up for some time.

William M. Mehlhorn, formerly general superintendent of the steel plant of the Eastern Steel Company at Pottsville, Pa., has been elected a director and vice-president in charge of manufacturing.

The Indianapolis Brass Company, 1012 East Michigan street, Indianapolis, Ind., is specializing in light and medium weight machine-made castings of brass, bronze, and aluminum. A line of sleeve bushings made from a special bearing bronze can be supplied in 12 sizes, ranging from $\frac{1}{4}$ to 3-in. outside diameter, the length of all the sizes being the same, 12-in. The material from which these bushings are made is said to be non-granular in structure, with a low coefficient of friction.

STEEL CORPORATION'S EARNINGS

Deficit for March Quarter, \$5,389,861—Deficit for March Quarter Last Year, \$6,289,644

The statement of the United States Steel Corporation's earnings for the quarter ended March 31, 1915, shows net earnings of \$12,457,809, against net earnings for the corresponding quarter of last year of \$17,994,381. The usual dividend of 1% per cent. on the preferred stock has been declared, the payment of which will leave a deficit for the quarter of \$5,389,861. No dividend was declared on the common stock. The great increase in March earnings indicates that the current quarter will show a surplus after paying the preferred stock dividend. The corporation has evidently turned the corner. The statement compares as follows with the first quarter of 1914:

| | 1915 | 1914 |
|---|-------------|-------------|
| January | \$1,687,150 | \$4,941,337 |
| February | 3,638,578 | 5,655,611 |
| March | 7,132,081 | 7,397,433 |
| Total earnings after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds of subsidiary companies | 12,457,809 | 17,994,381 |
| Less charges and appropriations for the following purposes: | | |
| Sinking funds on bonds of subsidiary companies and depreciation and replacement funds | 4,202,251 | 4,285,527 |
| Sinking funds on U. S. Steel Corporation bonds | 1,570,985 | 1,512,496 |
| Net income | 6,684,573 | 12,196,358 |
| Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding | 5,524,379 | 5,600,279 |
| Premium payable on bonds redeemable under sinking funds | 245,136 | 227,023 |
| Balance | 915,058 | 6,369,056 |
| Dividends for the quarter: | | |
| Preferred, 1% per cent. | 6,304,919 | 6,304,919 |
| Common, 1% per cent. | | 6,353,781 |
| Deficit for the quarter | \$5,389,861 | \$6,289,644 |

The earnings for the December quarter were \$10,933,170 and for the September quarter \$22,276,002. The December quarter showed a deficit of \$5,606,283, while the September quarter showed a surplus of \$89,479.

No Trade Commission Hearings in New York

WASHINGTON, D. C., April 27, 1915.—The Federal Trade Commission has had under consideration the formulation of rules for the consideration of complaints, the institution of independent investigations and the enforcement of its decisions. A general outline has been decided upon similar to that governing the Interstate Commerce Commission, and Commissioner Rublee will draw up the text of the rules of procedure. Chairman Davies states that in all cases, either under the trade commission act or the Clayton anti-trust law, the commission will first make an informal investigation. The parties alleged to have violated the law will be advised of the complaint and every effort will be made to compose the difficulty. If these efforts fail the commission will order a formal investigation and fix a date for hearing both parties. Commissioner Rublee states that in framing the rules of practice he will seek to make them as simple as possible. The informal investigations, in particular, will be provided for in such a way as to cause the least possible annoyance to the parties against whom complaints are filed.

It is stated at commission headquarters that there is no basis whatever for the widely published announcement that the commission intends to begin a series of hearings in New York in the first week in May, as a part of the investigation concerning the propriety of combinations organized exclusively to promote foreign trade. The investigation of this subject was decided upon soon after the commission was organized, but no decision regarding hearings has been reached. In view of the small appropriation now available it is probable that any hearings determined upon will be held in Washington.

W. L. C.

OBITUARY

JOHN H. LLOYD, formerly assistant to the president of the Morgan Engineering Company, Alliance, Ohio, died April 16 at his home in Alliance after an illness of about 18 months. He was born at Dowlais, Wales, July 27, 1859, and in the summer of 1874 began an apprenticeship in the machine shop of the Dowlais Iron Company. He went to Alliance in 1882 and secured a position with his uncle, the late Thomas R. Morgan, Sr., in the engineering department of Morgan, Williams & Co., now the Morgan Engineering Company, where he was successively draftsman, mechanical engineer, general superintendent and finally assistant to the president. He was a member of the Iron and Steel Institute. He leaves one son and one daughter.

ANTOINE FLORENT GUILLAIN, president of the Association of Metal and Mining Industries of France and of the Association of Electrical Companies, died April 20 in Paris, aged 71 years. He was a director of the Suez Canal Company and was connected with other important enterprises in France and abroad.

NATHAN A. TAYLOR, senior member of the N. & G. Taylor Company, manufacturer of tin plate, died of heart failure at his home at Chestnut Hill, Philadelphia, April 26, aged 69 years. A biographical sketch will be given in next week's issue of *The Iron Age*.

FRED WARD, of Fred Ward & Son, machinery dealers, San Francisco, Cal., died April 13, aged 58 years. He was born in Hampton, Ill., and had been in business in San Francisco for 25 years. He leaves a son, Roy C. Ward.

Iron and Steel Institute Annual Meeting

The annual meeting of the Iron and Steel Institute will be held in London, May 13 and 14. The president, Adolph Greiner, managing director of the Cockerill Works at Seraing, Belgium, who for a time was a prisoner in his own house, may not be able to attend. If he is absent, Arthur Cooper, his predecessor as president of the institute, will preside. The Bessemer gold medal for 1915 has been awarded to Pierre Martin, formerly of Sireuil near Paris. It will be received on his behalf by the French ambassador at London. The Andrew Carnegie gold medal for 1914 will be presented to E. Nusbaumer, Paris, and the award of research scholarships for the current year will be announced.

F. W. Adams: "Diffusion of Carbon in Iron."

J. O. Arnold and G. R. Bolsover: "Supplementary Notes on the Forms in Which Sulphides May Exist in Steel Ingots," Part II.

G. Charpy and A. Cornu: "Researches on Iron, Silicon and Carbon Alloys."

J. A. Newton Friend and P. C. Barnett: "Corrosion of Iron in Aqueous Solutions of Inorganic Salts."

J. A. Newton Friend and C. W. Marshall: (a) "Relative Corrodibilities of Gray Cast Iron and Steel." (b) "Note on the Removal of Rust by Means of Chemical Reagents."

A. Greiner: "Communication on the Heating of an Open-Hearth Furnace by Means of Tar."

R. A. Hadfield and G. K. Burgess: "Sound Steel Ingots and Ralls."

K. Honda: "The Nature of the A₂ Transformation in Iron."

A. McWilliam and E. J. Barnes: "Brinell Hardness and Tenacity Factors of a Series of Heat-Treated Special Steels."

A. M. Portevin and E. L. Dupuy: "Thermo-electric Properties of Special Steels."

J. H. Smith and G. A. Wedgwood: "Stress-strain Loops for Steel in the Cyclic State."

J. E. Stead: "Detection of Burning in Steel."

J. E. Stead: "Iron, Carbon and Phosphorus."

On Thursday afternoon Professor Hubert of Liège University will deliver a lecture on "Large Gas Engines." On account of the war the annual dinner is omitted.

The Vulcanite Portland Cement Company will move May 1 to 8 West Fortieth street, New York. The new location is opposite the Public Library.

MACHINE TOOL DEVELOPMENT

Discussion at New Haven Branch Meeting of Mechanical Engineers

The American Society of Mechanical Engineers held the regular spring meeting for members residing in New Haven and vicinity, in the Mason Laboratory of mechanical engineering of the Sheffield Scientific School of Yale University, Wednesday afternoon and evening, April 21. The attendance was large, the lecture room being filled. The general subject of the meeting was the development of machine tools. The discussion did not enter deeply into the final development of the art, which has resulted from the requirements of belligerent nations in seeking munitions of war and machines to manufacture them, but it included a highly interesting exposition of some of the machine tools of today and their accessories. All the papers were copiously illustrated by lantern slides.

Most interesting was the paper by Prof. Joseph W. Roe of the Sheffield Scientific School on the "Early History of Machine Tools," in which he traced the development of the industry from its beginning in about 1875. Luther D. Burlingame, of the Brown & Sharpe Mfg. Company, Providence, R. I., made an address on "Modern Developments in Milling Mechanics," and E. P. Bullard, Jr., of the Bullard Machine Tool Company, Bridgeport, Conn., on "Modern Developments in Vertical Boring and Turning Machines." H. W. Dunbar of the Norton Grinding Company, Worcester, Mass., talked on "Grinding as a Manufacturing Process." Darragh De Lancey, Waterbury, Conn., read a paper on "Special Forms of Presses for Working Sheet Metal."

A feature of the meeting was the illustrated paper by A. L. De Leeuw of the Singer Sewing Machine Company, Elizabethport, N. J., on "Milling Cutters and Cutting Tools."

The discussion which closed each session was led by E. V. Oberg, associate editor of *Machinery*, and L. P. Alford, editor of the *American Machinist*. From lack of time members did not enter into an expression of opinion.

Dr. Lester P. Breckinridge, head of the department of mechanical engineering of the Sheffield Scientific School, presided in afternoon meeting, and J. Arnold Norcross in the evening. The members and their guests dined at the Yale Dining Club.

Calvin W. Rice, secretary of the American Society of Mechanical Engineers, was a guest of the meeting and opened the evening session with an interesting speech, accentuating the importance of such branches as that which flourishes in New Haven.

Steel Corporation Improvements

The United States Steel Corporation's finance committee decided at its meeting this week to complete important improvements at the Edgar Thomson works of the Carnegie Steel Company. These involve the complete equipping of the new rail mill, on which construction work was begun two years ago but was interrupted; the building of a number of gas producers in connection with the open-hearth plant, and also the building of a number of new stoves at the blast furnaces.

At Lorain, Ohio, the National Tube Company will add equipment to its plant so as to be in position to roll slabs.

The Simmons Mfg. Company, Kenosha, Wis., is building a six-story steel-frame building, 80 x 400 ft., exclusively for the manufacture of light-steel beds. New machine equipment required will be largely of special design, built by this company, but a number of motors is to be purchased. The building is to be ready for occupancy July 1. A 1000-kw. Allis-Chalmers turbine has just been added to the company's power plant.

Pittsburgh and Nearby Districts

The Wheeling Steel & Iron Company, Wheeling, W. Va., has decided to add two hot mills to its 10-mill tin-plate plant at Yorkville, Ohio. Plans for the mills, with the doubling shears, squaring shears, sheet and pair furnaces and other equipment, are being prepared by S. Diescher & Sons, engineers, Farmers Bank Building, Pittsburgh, who built the Yorkville plant. The present mill building will house the new mills, one at each end. S. Diescher & Sons have sent out specifications for bids on the masonry, concrete piling and other work for the new mills to be added by the McKeesport Tin Plate Company, McKeesport, Pa., and in about two weeks will send out specifications for bids on the steel buildings, 20 hot tin mills, 21 cold mills and the necessary equipment for these mills to include doubling and squaring shears, engines, sheet and pair furnaces, etc. A long retaining wall is to be built on the Monongahela River beside the present plant and eventually a harbor will be formed which will allow tin bars to be received by water.

The American Spiral Spring & Mfg. Company, Pittsburgh, has elected directors as follows: John Pfeil, William McConway, Jr., L. L. Wolfe, J. B. Thomas and Robert E. L. Bailey.

The stockholders of the Youngstown Sheet & Tube Company, Youngstown, Ohio, have subscribed for practically all of the new issue of \$5,000,000 of preferred stock. The first quarterly payment on the stock is due July 1 and the remainder October 1, January 1, 1916, and April 1, 1916. Those who desire may pay the entire amount July 1, and 6 per cent. interest will be allowed on anticipated payments. The company will soon give out details of large plant additions to be made, comprising a by-product coke plant and probably merchant steel bar mills and more sheet mills.

Seceders from the Amalgamated Association, opposed to accepting the reduction of 11.2 per cent. in sheet mill wages and 6 per cent. in tin plate, and employed mostly in sheet mills in Wheeling, W. Va., and Martins Ferry, Ohio, have formed a new organization known as the United Iron, Steel and Tin Workers of America, and at a meeting held in Martins Ferry, Ohio, last week elected officers. It is stated that the new organization will have lodges in sheet mills in Martins Ferry, Wheeling, Granite City, Ill., and Ellwood, Ind. It is also claimed that lodges have been formed in sheet mills that heretofore have been non-union, but this is not confirmed.

The coal properties of the Pittsburgh-Buffalo Coal Company will be offered at public auction May 27, in the rotunda of the Allegheny County court house at Pittsburgh. George H. Calvert, Oliver Building, Pittsburgh, master for the Pittsburgh-Buffalo Coal Company, states that the Marianna mines, the Hazel mine, the Francis mine, the Johnetta mine, the Bertha mine and the Higbee tract will be offered. The properties are located in Allegheny and Washington counties, Pennsylvania.

Inland Steel Company News

The Inland Steel Company, Chicago, whose new benzol plant is expected to be completed by July 1, has already sold the entire output of benzol for the next two years. It is understood that the product as delivered by the company will ultimately enter into the manufacture of explosives, although it does not make a product directly available for that purpose.

The company has built a small experimental plant near its mines at Crosby, Minn., on the Cuyuna range, for the washing of low grade sandy ores. Its mines contain a very considerable tonnage of these ores, which, if they can be successfully washed, will become of merchantable quality.

New Benzol Plant at Duluth

The Zenith Furnace Company, Duluth, Minn., has placed contract for the building of a benzol plant to absorb the by-product output of its coke ovens, and the process there will include the extraction of toluol. Contracts have already been entered into for the sale of these products over the next year.

Machinery Markets and News of the Works

BIG SHELL ORDER REPORTED

American Locomotive Buys More Tools

Crucible Steel Company of America to Build Long Contemplated Extension — Railroads Buy Lightly

The war business continues to come out in such proportions as to overshadow all other activities of the trade. It is growing despite increased conservatism of machine tool builders in protecting themselves with regard to terms of payment. At the same time there has been a rather good run of domestic business in several cities and the prospects are for improvement in this direction. The American Locomotive Company has continued to buy tools and is now reported to have booked a \$75,000,000 order for shells which are to go to Great Britain. The Crucible Steel Company of America is going ahead with enlargements to its Harrison plant to facilitate the manufacture of its normal line of products. War orders have been quieter in Detroit but the demand for machine tools throughout Michigan is good. Foundries in that State are busy. The Milwaukee trade is handling war business conservatively and giving particular attention to domestic demands. Business of all sorts continues to come out in good volume in Cleveland; one inquiry calling for 130 multiple-spindle drilling machines. Orders for shrapnel forgings which are to be machined in Canada continue to be placed in Cleveland. Cincinnati reports that several foreign lathe orders have been cancelled for unknown reasons, but that a large amount of export business is still under negotiation, and foreign representatives are required to insure payment of what they buy. Conditions in the Central South continue to improve and there is a betterment in the Birmingham district also, though it is slow. St. Louis feels but little stimulus from the war. The Pacific Northwest is looking forward to the opening of the new Alaskan railroad to help industry in that region.

New York

NEW YORK, April 28, 1915.

War inquiry and buying show no abatement. Of the former, one company whose machines are in favor for the manufacture of shrapnel and shells, received more last week than at any time since the war began.

It was reported lately that the American Locomotive Company was purchasing machine tools to be prepared for a shrapnel sub-contract from the Canadian Car & Foundry Company, but this proved to be wrong, and the statement that the locomotive company had a large contract was premature as well. It is now reported that the company has received an order from Great Britain calling for 5,000,000 shells, the contract representing about \$75,000,000. The machine tool purchases of the company approximate \$1,000,000. Within a day or two they have bought at least 75 New Britain automatics and a large number of National-Acme and Gridley automatics.

The Crucible Steel Company of America recently made inquiry for a large number of machine tools, which gave rise to rumors that the company was anticipating a large order from Great Britain for projectiles. It was said that a new building was to be erected to house the machines and the story was printed far and wide in the newspapers. H. A. Brown, vice-president of the company, when asked for a statement, said that the newspaper reports of his company having received enormous contracts for munitions of war were canards. For a year his company has been contemplating an addition to the Atha plant at Harrison, N. J., and it has now decided to go ahead with the plans. He said the company's business in the East had shown a steady increase for the last six or seven months along its regular lines.

One of the important lines produced for many years at the Atha plant has been projectiles and gun forgings, some attractive orders for which had been received from the United States Government. The company also received a heavy contract from the Government for armor-piercing projectiles. The extension now projected, Mr. Brown emphasized, is for the further production of his company's normal line of products. As to foreign orders, or the contracts for the new building, he did not wish to be interviewed.

Inquiries directly due to war business, or the possibilities of it, are being received in New York from manufacturers all over the country, many of whom have taken sub-contracts from the Canadian Car & Foundry Company. Several of them have sent their representatives to this city. Almost without exception they have been disappointed when they learned of the time required for deliveries. A Dayton concern is at the point of closing for 68 turret lathes after reluctantly consenting to wait until July or August for the delivery of the machines.

The widespread manufacture of shrapnel in this country has caused an unprecedented demand for hydraulic presses such as are used in forming the blank forgings.

Ordinary domestic demand for miscellaneous machine tools is good, although there are no large lists before the trade from industrial sources. Makers of automobile parts and accessories have taken a few small groups of machines. The Chesapeake & Ohio Railroad inquired last week for two lathes and a planer, and the New York Central is in the market for some electric arc welders. The Lehigh & New England has not yet bought, but will do so soon. The number of machines ordered by the Seaboard Air Line to replace machinery destroyed by fire at Portsmouth was smaller than expected.

Maier & Flockhart, 60 Polk street, Newark, N. J., iron foundry, are rebuilding their core shop at an estimated cost of \$9000. No additional equipment is specified.

The New Jersey board of public utility commissioners, Trenton, N. J., has approved the application of the Plainfield-Union Water Company, Plainfield, N. J., to issue \$100,000 of bonds for improvements, extensions, etc.

The Midvale Chemical Works, 705 Oliver street, St. Louis, Mo., has purchased a site in Bayway, near Elizabeth, N. J., and is erecting buildings for the manufacture of anilines and similar products.

A company to manufacture special machinery and appliances has been incorporated with a capital stock of \$25,000 at Rochester, N. Y., under the name of Master Mechanic, Inc., by H. I. and C. T. Hathaway, 1545 East avenue, and W. T. Bradley, E. & B. Building, Rochester.

The Howes Construction Company, New York City, has received contract for erecting additional stories on the brick, steel and concrete hardening and packing buildings at the plant of the New Process Gear Corporation, Syracuse, N. Y. The Lackawanna Bridge Company, Buffalo, has the sub-contract for the steel. Plans are also under preparation for a four-story brick, steel and concrete factory to be erected by the New Process Gear Corporation.

The Henry Connolly Company has let contract for construction of a printing plant, 90 x 100 ft., which it will build on Elizabeth street.

The Hammond Light & Power Company, Hammond, N. Y., has been incorporated with a capital stock of \$25,000, and will build a power plant. M. and W. S. Soper and F. H. Bertrand are the incorporators.

The Sowers Mfg. Company has let contract for erection of an addition to its plant at 1300 Niagara street for the manufacture of special machinery.

Philadelphia

PHILADELPHIA, Pa., April 26, 1915.

J. Alan Middleton, engineer, 516 New Stock Exchange Building, Philadelphia, is asking bids on the following equipment: Ten single, 8 2-spindle and 8 3-spindle sensitive drill presses, 12 10-in. polishing heads, 4 12-in. x 6-ft. hollow spindle lathes, 4 milling machines, 1 universal milling machine, 1 vertical milling machine, 3 14-in. back geared lathes, 1 20-in. back geared lathe, 1 24-in. shaper, 3 2-ton stamping presses, 1 8-ton, 3-in. stroke press.

The John E. Thropp's Sons Company, Trenton, N. J.

manufacturer of presses, etc., is replacing its machine shop by a new building, 65 x 320 ft., of steel and glass construction, equipped with electric traveling cranes. The contract for the equipment has been placed.

The Eureka Flint & Spar Company, Trenton, N. J., has had plans drawn by W. B. Thines, Commonwealth Building, Trenton, for a one-story power house, 36 x 85 ft.

The Union Mfg. Company, Boyertown, Pa., manufacturer of sadirons, etc., will build an addition to its moulding room, 30 x 55 ft. No additional equipment will be needed.

New England

BOSTON, MASS., April 27, 1915.

Underlying the feverish activity of the machinery trade in its relation to orders having to do with the manufacture of war supplies is a well-established belief that business in general is improving. So firm is this conviction that some manufacturers are preparing to take care of their regular customers, whose wants have been small, to the sacrifice of alluring war business. In other words, the steady trade is being courted, where previously it has been disregarded because its wants have been few. A company operating a large drop forging plant, for example, has refused to accept business, guaranteed financially, for shrapnel cases, beyond a certain limit, because old customers are entering the market for their normal requirements.

The \$80,000,000 named as the amount of the Canadian Car & Foundry Company's contract is labeled shrapnel, and some of the companies mentioned in connection with it have been pestered, as they put it, by people who have the impression that "shrapnel" means the forging or the brass cartridge case. As a matter of fact, the larger part of the contracts named are for minor pieces of a shell. For example, the Blake & Johnson Company, Waterbury, Conn., one of the list, amount \$22,000, is under contract to make that value in rather small screws. Since the company's name appeared in this connection the management has been swamped with inquiries from persons who have received the impression that the company's product comprised the heavier parts of a shell. Such is the common experience. So far, New England manufacturers of forgings have received only a small part of the Russian contract. They were already pretty well tied up on this class of business.

The published list of contracts let by the Canadian Car & Foundry Company has created much interest. The chief element in deciding awards was deliveries, and herein rest the errors of the list. For example, the Mead-Morrison Mfg. Company, Boston, is down for \$900,000—originally a correct statement—but the contract was not closed because of the matter of deliveries. The Worcester Mfg. Company, Worcester, Mass., which operates a foundry, is credited with a contract of \$480,500, and this has not been closed, presumably for the same reason.

The supply of every type of machinery that enters into the manufacture of war supplies is at the lowest ebb. Quoted deliveries are months in the future. This applies to many types of presses. The shops in Waterbury, Conn., and other places are simply jammed full of orders. And mingled with the war element of the business, the domestic demand, for purposes very foreign to the war, is coming constantly to be a more important factor.

The brass mills of the Naugatuck Valley are very busy on much of their product. The war orders affect them vitally.

To New England, with its great textile machinery industries, the condition of the textile trade is an exceedingly important factor. Some considerable improvement is noted, sufficient to stimulate the demand for textile machinery to some extent, and thus indirectly the demand for machine tools, though the latter influence is usually slow in making itself felt. The labor situation as regards skilled mechanics has become somewhat acute. There are not enough men to go round. The centers of the machinery industry, and those places which, while employing a lower average of operatives, are using metal-working machinery are beginning to complain. These cities are beginning to advertise for help, one against the other. The various bureaus organized for the distribution of labor find proof of this statement in their records.

The Rockwood Sprinkler Company, Worcester, Mass., manufacturer of automatic sprinkler systems, has begun the erection of an additional building, the foundations of which were put in last fall. The structure will be 114 x 280 ft., three stories, and will be devoted to the pipe department, where heavy machinery is required and where the material used necessitates easy handling, which will be facilitated by a spur track from the Worcester & Nashua division of the Boston & Maine Railroad. The shipping department will also be transferred to the new building. The congestion in the pres-

ent factory will be relieved, particularly for the department that manufactures the Rockwood pressed steel union. The company is in the market for presses with which to increase the output of this product.

The Stafford Iron Works, Inc., is the name of a new Massachusetts corporation, with \$50,000 capital stock, which will manufacture ornamental iron and do a general forging business in Worcester, Mass. The company has purchased land and will erect works on Stafford street, the initial building to be 40 x 100 ft. Some equipment will be required in the beginning, consisting of a combined punch and shears, punch, drilling machines and miscellaneous tools. The president is Charles F. Davis, New York; treasurer, Mathias B. Walls, New York; clerk, Thomas E. Aykroyd, Auburn, Mass.; general manager, G. Stanley Walls, Worcester; with Albert Aykroyd, Auburn, as the fifth director.

The Chase Metal Works, Waterbury, Conn., has begun the construction of a factory 60 x 180 ft., two stories.

The Hart & Cooley Company, New Britain, Conn., manufacturer of steel registers and other sheet-metal goods, has awarded the contract for an additional story to a factory building, 50 x 200 ft.

The Whitney Mfg. Company, Hartford, Conn., manufacturer of transmission chain and machine tools, is preparing plans for an extension of its main factory, the new structure to be four stories and basement, about 60 x 64 ft.

The H. B. Ives Company, New Haven, Conn., is planning to build a boiler house 24 x 44 ft., of brick and steel.

It is understood that the Fore River Shipbuilding Company, Quincy, Mass., will build large additions to its shops.

The Kilburn Mills, New Bedford, Mass., cotton manufacturer, will build an addition to one of its mills, 140 x 160 ft., three stories, and a three-story addition to a storehouse, 100 x 120 ft.

The Boston & Worcester Street Railway Company, which operates a line connecting Boston and Worcester, proposes to centralize its repair shops in Framingham, Mass.

Catalogues Wanted

F. P. Lyons, P. O. Box 609, Manchester, N. H., has established an architectural and ornamental iron works, and desires to receive catalogues and price lists on labor-saving devices for this line.

Baltimore

BALTIMORE, MD., April 26, 1915.

Spring building is getting under way and favorable weather is permitting it to progress rapidly. That business is improving is indicated by the fact that the Baltimore & Ohio Railroad Company is putting many men back to work. The Mt. Clare shops in Baltimore are expected soon to employ the full complement of men working on full time.

Under a decree of the court the property of the Skinner Drydock Company, which has two plants in Baltimore, has been sold at auction. Both the real estate, which brought \$100,000, and the unmortgaged assets, which sold for \$55,000, were bought by the bondholders' committee. It is said that the business will be reorganized and continued.

The Prudential Oil Corporation, which is constructing a plant at Fairfield, Md., will substitute electricity for steam in the many departments. It is said to be the first plant of its kind to make this substitution on a large scale. The work of construction probably will be completed this summer. George F. Benhoff will be superintendent. The plans call for six storage tanks of 55,000 bbl. capacity each; 90 small working tanks, a barrel house 60 x 250 ft., wax house to cost \$200,000, filtering plant, boiler house containing three large boilers, agitator building, machine shop, storeroom, pump-house, two still-houses, two pumphouses and an office building. William McMakin, superintendent of construction, states that the plant will cost about \$1,000,000.

Contractors have been asked to bid on the construction of a four-story brick and concrete factory, 90 x 140 ft., and a two-story pumphouse, 26 x 58 ft., to be erected by the Canton Company, for W. W. Boyer & Co., 2327 Boston street, Baltimore, canned goods and tin can manufacturers.

The construction of a cold storage plant, to cost about \$100,000, is rumored. A representative of the C. D. Cooley Company, architect, Pittsburgh, was here recently, securing estimates on 5000 bbl. of cement for use in the proposed structure, which will be located on Pratt street, where several properties have been purchased by D. List Warner, attorney.

Plans are being made for the rebuilding of the brick yards of Mayer Brothers, Frostburg, Md. Henry Mayer is president.

The capital stock of the Hancock Shale Brick Company, Hagerstown, Md., has been increased from \$30,000 to \$40,000.

The Independent Ice Company has asked permission of the city to use the properties from 313 to 319 North Holliday street, as a public garage and repair shop.

The Hall-Seeley Motor Corporation, Continental Building, Baltimore, Md., has been incorporated with a capital stock of \$1,000,000, and plans to build a plant for the manufacture of high duty gasoline and oil motors. C. Ford Seeley is in charge.

Chicago

CHICAGO, ILL., April 26, 1915.

The canvassing of this market by agents of foreign governments, for machine tools available for prompt delivery, continues, and each week the dealers are doing a fair business of this sort. Domestic inquiry reveals no very large business, but there is a fairly steady flow of small orders. As yet no orders have been placed on the large railroad lists recently issued. Further railroad business is promised in the expected lists from the Chicago & Northwestern which are understood to be now in preparation. The Mann Corporation, Kankakee, Ill., has acquired a plant for the manufacture of small specialties and will shortly be in the market for a few tools.

The city of Chicago is building at 3100 South Sacramento avenue a foundry 21 x 141 ft., a blacksmith shop 40 x 90 ft. and a two-story machine shop 50 x 306 ft., to cost in the aggregate about \$230,000. C. W. Kallel is city architect.

The Chicago Structural Steel Company, Chicago, has been incorporated with a capital stock of \$40,000 for the fabricating and erecting of steel and iron work. The incorporators are M. K. Kanary, C. M. Curran, 4121 North Hermitage avenue, and F. J. Bonner.

The L. A. Stewart Company, Chicago, has been formed by L. A. Stewart, Pearl L. Stockburger and Loyal L. Smith, to build oil tanks, etc. It has a capital of \$2500.

J. Nicholson will erect a one-story factory, 50 x 125 ft., at West Fifty-ninth and Throop streets, Chicago, to cost approximately \$8000. A. J. Lund is the architect.

The Solar Metal Products Company, 2502 South Paulina street, Chicago, is having plans made and will ask bids about April 26, on three buildings of steel and concrete, 100 x 230 ft., 50 x 120 ft., and 50 x 60 ft.

The R. F. Conway Company, 1931 Wendell street, Chicago, has let a contract to W. A. Pillinger & Co., 64 West Randolph street, for a small steel plant.

The Mechanical Products Company, Chicago, has been organized with a capital stock of \$2500 to manufacture castings, implements, tools and machinery by Bruno Pascale, E. R. Hartigan, 209 South LaSalle street, and C. W. Paltzer.

The Kramer Rotary Harrow Company, Morton, Ill., has been incorporated with a capital stock of \$50,000 by Leonard Hillis, M. B. Kennedy and A. S. Gibson, to manufacture rotary harrows.

The Apollo Metal Company, of Peru, will erect a factory and remove its plant to LaSalle, Ill., as its present quarters are inadequate. It is having special equipment of its own design manufactured.

Howard L. Mann has bought a plant at Bradley, Ill., and will manufacture small steel specialties under the name of the Mann Corporation. It will be in the market for a few small machine tools.

Stanton, Ill., is receiving bids for horizontal, high-pressure fire-tube boilers. Henry W. Fritz is city clerk.

The Illinois Valley Silica Company, Ottawa, Ill., has been incorporated with a capital stock of \$100,000 by W. D. Moore, P. I. Thornton and D. A. Murphy.

The Electro Pneumatic Skid Company, Centralia, Ill., has been incorporated with a capital stock of \$100,000 by C. D. Oland, L. W. Woley, J. M. Stansell and George Maln.

The Chicago Structural Steel Company, Cicero, Ill., has been incorporated with a capital stock of \$40,000 by M. H. Kanary, C. M. Curran and F. J. Bonnar, and will engage in structural steel fabrication.

C. A. Litt, Spencer, Iowa, is taking bids on a two-story and basement foundry, 22 x 86 ft., for the Multiblade Razor Company.

The Sheridan Stove Company, Quincy, Ill., has been incorporated with a capital stock of \$75,000 by E. H. Huenefeld, Laurence C. Smith and W. H. Covert, to manufacture stoves.

Bids will be received until 1.30 p. m., May 3, by W. B. Garvin, town clerk, Morning Sun, Iowa, for a pumping station, a 30-gal. per min. pump, 6-hp. engine, 6-hp. electric

motor, and a 50,000-gal. tank with tower and cast-iron pipe.

Charles H. Chandler, state architect, has completed plans for a new pump station at Leavenworth, Kan.

The Soo Iron Works Company, Des Moines, Iowa, has been incorporated with a capital stock of \$15,000 by C. W. Taylor, Milton P. Smith and Louis Kettleson.

Milwaukee

MILWAUKEE, WIS., April 26, 1915.

Hesitancy is discernible in the movements of Milwaukee tool builders with reference to export orders growing out of war needs, particularly in cases where present facilities are hardly adequate to meet specifications on delivery. Contractors refuse to make expenditures for extensions which might or might not be useful after the war is over. They also do not feel inclined to place their entire works at the command of foreign countries if that should cause prospective hardships on domestic buyers. Export demand, which has featured the tool business of the last six or eight months, cannot go on indefinitely, while domestic demand is bound to grow from now on, and must be met promptly if only for the sake of future prestige. Conservatism rules the present situation. Orders smacking of "ready money" are not permitted to go by the board; but no one is in too great a rush to take chances of not being able to meet domestic requisitions by letting everything go abroad. Milwaukee tool builders expect to share in the reported heavy purchases by railroads, but at this time have nothing tangible to figure upon.

Edwin J. Lansing, secretary of the Federal Pressed Steel Company, Milwaukee, confirms the report that it has received a sub-contract from the Canadian Car & Foundry Company, covering part of the latter company's requirements for its \$80,000,000 order for shrapnel from Russia. The amount of the contract is indefinite, but may run well over \$1,350,000. The local company is building an addition 100 x 200 ft., to cost \$10,000, principally to take care of this business.

The Frank L. Wells Company, Kenosha, Wis., is adding equipment, including three large milling machines, to meet a heavy demand for machined castings and material, notably for the Thomas B. Jeffery Company, Kenosha, which is supplying the allied nations with motor trucks. The Wells shop has been on a 24-hr. a day schedule for more than 10 days and expects to maintain this for some time longer. Nearly every industry in Kenosha is reporting decided improvement.

The report that the Four-Wheel Drive Auto Company, Clintonville, Wis., is planning to re-locate its plant is unfounded.

The Goethel Blowpipe & Ventilating Company has been incorporated with a capital stock of \$2000 by Katie S. Goethel, Peter Smith and Edward Smith.

The American Fire Alarm Mfg. Company, West Allis, Wis., has been incorporated with \$25,000 capital by Otto B. Poenisch, A. C. Menninger and August R. Meyer, to manufacture electric alarm systems.

Henry Rolfs has disposed of his half interest in the West Bend Plating & Mfg. Company, West Bend, Wis., to Abraham Herman, who will assume an active part in its management.

L. A. Lumm, Edgerton, Wis., is establishing a shop for automobile and general machinery work.

The DuPont Powder Company is planning extensive improvements at its Barksdale plant near Ashland, Wis., including a new triton line, new set of boilers, new waterworks system and enlargement of the acid works. F. T. Beers, superintendent, has just returned from Wilmington, Del., with specifications.

The board of education, Manitowoc, Wis., has engaged J. M. Smith, consulting engineer, Madison, Wis., to prepare plans for a central light, heat and power plant for Manitowoc public schools. The basement of the plant will be used for the manual training department.

The Badger Lumber & Mfg. Company, Oshkosh, Wis., has been incorporated with \$20,000 capital stock by H. I. Boynton, Paul Steinhilber and Richard Saltseder.

The Slyver Steel Casting Company, Thirty-seventh avenue and Mitchell street, Milwaukee, is about to erect a 74 x 90-ft. addition of brick and steel to its foundry and will add metal melting capacity in keeping with the increased floor area. Klug & Smith, architects and engineers, Milwaukee, are in charge.

The report that the Northwestern Barrel Company, Milwaukee, Wis., will rebuild its plant recently destroyed by fire, is incorrect. It has moved to a new location and purchased an existing plant, remodeled for its special purposes.

Clarence S. Anderson, Lake Geneva, Wis., has established a shop for the manufacture and repair of sheet metal work, general machine work and automobile repairing.

A. C. Erickson, for several years an expert mechanic associated with the McDonough Mfg. Company, Eau Claire, Wis., has established a machine shop and automobile service station on the second floor of the garage of the Chippewa Valley Automobile Company, Eau Claire. He will do repairing for the garage company and a general line of commercial work.

Schmidt & Stork, manufacturers of farm wagons and vehicles, West Bend, Wis., are buying a small lot of machinery and equipment. A multiple spindle boring mill has been purchased from the Wayne Machine Company, Wayne, Ind.

E. M. Smith, Rice Lake, Wis., is having plans made for the erection of a garage and machine shop.

The Sprinkmann asbestos packing and pipe covering plant at Eleventh and Davis avenues, South Milwaukee, has resumed operations after being closed during the winter months. New capital has been introduced and a period of uninterrupted operations is anticipated.

The Werra Aluminum Company, Waukesha, Wis., is making changes in the interior of its plant, formerly the old Wisconsin Central road's carshops, to gain additional space. No important extensions are contemplated.

Indianapolis

INDIANAPOLIS, IND., April 26, 1915.

The Chicago & Eastern Illinois Railroad is reported to be planning the establishment of shops at Princeton, Ind., to take the place of those at Evansville.

The Madison Motors Company, Anderson, Ind., is planning a one-story brick extension to its present factory which will add approximately 70,000 sq. ft. of floor space.

The Interstate Equipment Company, South Bend, Ind., manufacturer of concrete mixers, was recently incorporated to take over the business of Adam Hunsberger. It is considering the installation of a $\frac{3}{4}$ x $\frac{3}{4}$ -in. metal punch.

The Vocational Supply Company, Muncie, Ind., recently incorporated by E. L. and F. R. Griffith, of G. V. Griffith & Son, Muncie, will use the equipment and factories of the latter company and will build a small addition.

The Allen County Electric Light & Power Company, Grabill, Ind., has been incorporated with \$15,000 capital stock by A. A. Porter, P. S. Amstutz and G. H. Krudop.

The Swan Motor Car Company, Indianapolis, has been incorporated with \$50,000 capital stock to manufacture motor vehicles. The directors are H. J. Herff, I. P. and R. H. Smith.

William M. Smith, Division street, Evansville, Ind., is organizing a company with a capital stock of \$100,000, which will establish a plant at a cost of \$20,000 for the manufacture of a railway safety device, including about \$10,000 worth of machinery.

The Chicago & Eastern Illinois Railroad will establish shops at Princeton, Ind., it is reported. The shops have heretofore been maintained at Evansville, Ind.

Frank Phillips, Walter Golden, William Summers, and others, all of Columbus, Ind., have formed the Columbus Foundry Company. Mr. Phillips is general manager.

The Martindale-Millikan Company, Indianapolis, has been incorporated with \$85,000 capital stock by F. M. Millikan, F. N. Martindale and J. H. Staley to manufacture automobiles and accessories.

Edgar G. Martin has been appointed receiver for the Hercules Motor Car Company, New Albany, Ind. He has been authorized to rent the property to the Hercules Sales Company, Louisville, Ky., which was recently organized and will continue to operate part of the plant.

T. A. Goodin, Edinburgh, Ind., has been appointed receiver for the Interstate Electric Company.

D. E. Talbott & Sons' planing mill, Westfield, Ind., was burned April 20 with \$25,000 loss.

The Backstay Machine & Leather Company, Union City, Ind., has increased its capital stock from \$120,000 to \$160,000.

The receipt of another big munitions of war order, announced in dispatches as being for \$10,000,000, by the Aetna Explosives Company, New York, has stimulated construction work on its new guncotton factory at Aetna, just east of Gary. When completed the new factory will have ten times the capacity of the present guncotton department at Aetna, and will require 800 additional operatives. Large forces of men from Gary are working day and night shifts to complete the factory by June 1. So sudden was the order to start building that Gary was temporarily drained of all its mechanics' tools.

The Aetna company also plans to engage in chemical lines heretofore known only in Europe, and the new factory is only a series of several to be built, two of which will be started this summer.

Cleveland

CLEVELAND, OHIO, April 26, 1915.

Machine-tool business continues to come out in good volume. Domestic demand for turret lathes for making war material and other purposes is good. Dayton manufacturers who recently took large war orders are still buying machinery and one of these has finally placed orders that have been pending two or three weeks. These include 130 multiple spindle drilling machines taken by a Cleveland dealer, and automatic and forging machines to be furnished by Cleveland builders. A southern Ohio steel company is understood to have placed orders for \$40,000 worth of machinery. Some additional inquiries for shrapnel are pending and considerable machine tool business for making war material is still in prospect. A fair volume of export business continues to come out. A Cleveland manufacturer has booked additional orders for shrapnel forgings, the machine work on which will be done in Canadian plants. Outside of war business a good demand has developed for small lots of machinery which are going largely to makers of automobiles and accessories. One order from a Michigan accessory maker is for 15 sensitive drilling machines.

The Rummel Machine Screw Company, 1978 West Seventy-seventh street, Cleveland, will shortly move to Fostoria, Ohio, where it will be consolidated with the H. & M. Screw Company, of that city. A new company, the name of which has not yet been decided upon, will be formed of the merged interests. It will occupy quarters in a building recently purchased by the Fostoria Factories Company from the General Electric Company. In addition to the present screw machine products, the company will go quite extensively into the manufacture of automobile spring bolts and will also do case hardening.

The Standard Starter & Specialty Company, Cleveland, has been incorporated with a capital stock of \$15,000 to make automobile parts and accessories, by C. K. Fauver, and others.

De Mooy Brothers, 1831 East Fifty-fifth street, Cleveland, have sold their machine shop to a new company that has been formed with a capital stock of \$10,000 by Arnold Ruetschi, Herbert O. Evans, and others. The new company will do a general machine shop and automobile repair business, and plans later to begin the manufacture of automobile transmissions.

The West Steel Casting Company, Cleveland, maker of converter and crucible steel castings, is increasing its molding floor space by additions which will cover an area of 43 x 220 ft. New 10-ton and 5-ton traveling cranes, a drying oven and several new molding machines comprise a part of the new equipment. The recent purchase of a saloon and some dwelling properties adjoining the plant has enabled the company to enlarge, the work being done in anticipation of the demand that will come when business improves.

The Lakewood Motor Washer Company, Cleveland, is a new company that is establishing a plant at 1263 West Second street for the manufacture of water motors for washing machines.

The Hydraulic Pressed Steel Company, Cleveland, has plans prepared for the erection of a two-story building for the manufacture of steel barrels; but no decision has been reached as to when this plant will be built.

The Poes Machinery & Mfg. Company, Cleveland, has been formed with a capital stock of \$10,000 by M. S. Ferris, B. M. Merrills, and others, to manufacture metal specialties.

The Cleveland Machine & Supply Company, recently organized, has moved into permanent quarters at 419 Frankfort avenue, where a display room will be maintained. It will handle the complete line of the Hamilton Machine Tool Company machines and other lines of machine tools.

The city of Cleveland will receive bids May 6 for a tunneling machine to be used in connection with the West Side tunnel construction and for venturi meters and steam and feed water pipe for the Division avenue pumping station. On May 7 bids will be taken for rotary converters, transformers and switching equipment for the new municipal electric light department.

The Hallock Engine Company, Cleveland, has been incorporated with a capital stock of \$25,000 by Thomas P. Hallock, and others, to manufacture automobile accessories.

The Ohio Sheet Metal Company, Canton, Ohio, has been incorporated with a capital stock of \$50,000 by J. H. Eller, of the Eller Mfg. Company, and others.

The Beckwith Railway Fog Signal Company, Fostoria, Ohio, has been formed with a capital stock of \$100,000 and will erect a plant for the manufacture of railway torpedoes. H. J. Adams is president; Charles G. German, secretary, and Walter C. Beckwith, Jr., general manager.

The B. F. Goodrich Company, Akron, Ohio, is planning the erection of a large addition to its plant this year.

Cincinnati

CINCINNATI, OHIO, April 26, 1915.

It is reported that several foreign lathe orders have been cancelled lately; but for what reason is not known. While a large amount of foreign business is still under negotiation, the matter of terms has caused machine-tool builders to hesitate in accepting the orders. Numbers of purchasing agents, unknown to the trade, have sprung up both in this country and in Europe, and naturally bank guarantees are demanded with all orders placed by such buyers. Cincinnati machine-tool builders have lately been visited by a number of machinery dealers from both France and Russia; but it is stated that the object of their visits was principally to establish agency connections and not to place orders. It is known, however, that one order for 125 lathes was turned down last week, because deliveries could not be made early enough to suit the purchaser.

Makers of portable electric drilling machines and grinders have lately received some excellent business, most of which is of domestic origin, although quite a number of tools have been ordered by European customers for urgent shipment.

Confirmation has been received from quite a number of manufacturers in this territory of orders for war munitions. It is understood that these orders were placed under guarantees to accept the material regardless of the outcome of the war in Europe. Both lathes and hydraulic forging presses have been contracted for quite freely by firms who have accepted this business, but delays in the deliveries of these machines cause considerable annoyance. It is also rumored that a few firms have found it impracticable to use steam hammers in forging shrapnel cases, and have been compelled to contract for heavier hydraulic machines.

It is reported that the Huenfeld Company, Cincinnati, manufacturer of ranges and hardware specialties, is having plans prepared for an addition to its plant on Spring Grove avenue, that will more than double its present capacity. No machinery lists have yet been made up.

The National Lead Company, Cincinnati, is planning to enlarge its plant on Freeman avenue. The proposed improvements will cost approximately \$40,000. Very little machinery will be required.

The Boye & Emmes Machine Tool Company, Cincinnati, has let contract for extensive alterations to its plant on Buck street. The proposed improvements include a saw-tooth roof and changes in the interior arrangements of the machine shop.

The Hanauer Automobile Company, Cincinnati, has leased a building at Court and Sycamore streets, and will soon move from its present location on Reading road.

The William Kohel Mfg. Company, Jamestown, N. Y., manufacturer of paper boxes, is reported to have acquired a building in Cincinnati that will be fitted up for manufacturing purposes at an early date. Details are not yet available.

The Patton Bin & Fixture Company, 1413 Plum street, Cincinnati, has been incorporated with \$150,000 capital stock by Charles Weber, A. G. Beck and others. It will fit up a plant for the manufacture of special store fixtures.

The Brighton Pole & Shaft Company, Cincinnati, has been incorporated with \$10,000 capital stock by George W. Platt and others, to manufacture wagon accessories.

The Hooven, Owens, Rentschler Company, Hamilton, Ohio, denies that it has acquired the plant of the Dayton Malleable Iron Company, Dayton, Ohio, as has been reported in the press dispatches.

The Barbeau Grain Hulling Machine Company, Dayton, Ohio, has acquired the abandoned plant of the Davis Soap Company, and will fit it up for the manufacture of grain hulling machines.

It is rumored that the Standard Register Company, Dayton, Ohio, contemplates adding to its manufacturing facilities at an early date.

A cold storage plant will be built by the Boylus-Hackett Company, Springfield, Ohio, for which refrigerating equipment will be required.

The Clinton Fire Extinguisher Company, Piqua, Ohio, manufacturer of hand fire extinguishers, has increased its capital stock from \$5,000 to \$10,000, and is planning an addition to its plant.

The Belfast Iron Works Company, Ironton, Ohio, confirms the report that it is erecting a building for the manufacture of woven wire fencing. The addition under construction will be 120 x 160 ft., one story, of brick and steel construction. Nearly all equipment has been purchased.

The Piqua Machine & Boiler Company, Piqua, Ohio, has been incorporated with \$10,000 capital stock to manufacture small water-tube boilers. John F. O'Brien is one of the incorporators.

The Monarch Machine Company, Sidney, Ohio, is making an addition to its plant that will be 52 x 200 ft., one story, of brick construction.

The Klein Garage Company, Cincinnati, has had plans prepared for a garage and repair shop that will be located in the Camp Washington district.

M. R. Carpenter, refrigerating engineer, Pickering Building, Cincinnati, is preparing plans for a cold storage plant for the Natchez Fish Company, Natchez, Miss.

Walter G. Franz, consulting engineer, Union Trust Building, Cincinnati, has prepared plans for an addition to the power plant of Miami University, Oxford, Ohio.

The Special Equipment Company, Cincinnati, maker of drying and heating apparatus, has leased a building at Sixth and Jane streets, and will move its factory to the new location.

Detroit

DETROIT, MICH., April 26, 1915.

So far as can be ascertained the local market has not been greatly affected by war orders the past two weeks. The demand for machine tools in Detroit and vicinity is fairly strong, and the outlook is characterized by dealers as promising. Business is still coming from the automobile industry and miscellaneous orders from scattered sources make a very fair volume of business. Inquiries are somewhat lighter. The foundry trade is active and both gray iron and steel castings plants are getting a good volume of orders. Construction work is lighter than normal, with nothing new of importance in the industrial line.

The Boss Tractor Company, Detroit, has been incorporated with a capital stock of \$125,000 to manufacture tractors. The principal stockholders are Byron F. Everitt, Charles E. Baumheckel and Edwin R. Evans.

The Detroit Pneumatic Chuck Company, Detroit, has been incorporated to do a general manufacturing business in machinery and machine tools by George W. Morrison, Ree M. White and Edward A. Harding. It is capitalized at \$30,000.

The Keystone Brass Mfg. Company, Detroit, has been incorporated with \$20,000 capital stock to operate a brass foundry and manufacture brass articles. The incorporators are Michael H. Green, George G. Leonard and Clifton P. Weil.

The Regan Efficiency Company, Detroit, has been incorporated with a capital stock of \$25,000 to manufacture a line of efficiency devices. The principal stockholders are Edgar G. Regan, Marvin E. Hall and Herbert A. Mitchell.

The J. W. Murray Mfg. Company, Detroit, manufacturer of automobile accessories, has increased its capital stock from \$80,000 to \$200,000. It has recently completed an addition to its plant 40 x 168 ft. and has begun the construction of a second addition 40 x 100 ft. The additions will increase the present capacity of the plant more than half.

The Detroit Reamer Salvage Company, Detroit, has been incorporated with \$2500 capital stock to manufacture machinists' tools. William W. Blakely and Stuart A. Cogdell are the principal stockholders.

The Michigan Truck & Lumber Company, Holly, Mich., is increasing the capacity of its plant by an addition 30 x 70 ft., one story.

The Comstock Automatic Pump Company, Comstock, Mich., has been incorporated with \$10,000 capital stock to manufacture water pumps. The incorporators are Charles H. Barnes, E. P. Montague and L. S. Deal. It will erect and equip a factory in the immediate future.

Negaunee, Mich., has voted to bond for \$25,000 for waterworks improvements and extensions.

The Rudy Furnace Mfg. Company, Dowagiac, Mich., has been incorporated with \$25,000 capital stock to manufacture furnaces. A factory will be erected. A. E. Rudolph is president.

The Limousine Top Company, Kalamazoo, Mich., has been incorporated with a capital stock of \$25,000 and will manufacture a line of vehicles, automobile tops and accessories.

The Michigan Metal Works, Grand Rapids, Mich., has been incorporated with a capital stock of \$2000, by Floyd B. Harrington, Lansing; James Vanderwaals and Clare J. Hall, Grand Rapids, to manufacture sheet metal products.

The Comstock Automatic Pump Company, Comstock, Mich., which was recently organized with a capital stock of \$10,000, will build and equip a factory.

Enberg's Electric & Mechanical Works, St. Joseph, Mich., manufacturer of dynamos and engines, will build a concrete and brick factory, 75 x 200 ft., at an approximate cost of \$20,000. Construction work will start within a month. D. D. Merrill is secretary.

The Twin City Boiler Works, St. Joseph, Mich., whose plant was recently destroyed by fire, plans to build a new factory at Benton Harbor.

The Benton Harbor Malleable Company, Benton Harbor, Mich., will erect a drop forge plant on a site adjoining its present factory.

The Wilson Foundry Company, Pontiac, Mich., is adding to its plant a machine shop 100 x 125 ft., and is increasing the core room and molding floor capacity of its foundry. The melting equipment in the foundry is to be enlarged as well, and an installation of cranes for handling the hot metal and castings is to be installed.

Birmingham

BIRMINGHAM, ALA., April 26, 1915.

While the volume of business is still far behind what it was at this time last year—as much as 50 per cent. in some cases—the improvement is admitted to be persistent, although slow. The sawmill demand is the leader and is proving very satisfactory. Machine tools are dull. Boilers, engines and pumps and gasoline engines are in good demand. The outlook is considered fair to good. Gasoline engines are selling on a large scale, owing to the demand created by interest in diversified farming in Alabama and adjoining states. A general line of pumps is also being sold. The inquiry has improved in several quarters, presaging a larger volume of business.

The Cotton Seed Oil Company, Augusta, Ga., will establish a mill at a cost of \$125,000 to \$150,000. Richard F. Hoyt, Boston, Mass., is president.

The Georgia Slate & Granite Company, Atlanta, Ga., has been incorporated with a capital stock of \$150,000 by William Stackhouse and W. M. Monroe, Marion, S. C., and others.

The Georgia Electric Company, Atlanta, Ga., has been incorporated with a nominal capital stock of \$5000 and privilege to increase it to \$10,000,000. It purposes to develop water power. B. O. Bittick, W. M. Bennett, and others, are among the incorporators.

The Lead Hill Machine & Foundry Company, Arcadia, Fla., plans the establishment of a foundry and machine shop. R. E. Lee is president.

The Yolande Coal Company, Birmingham, of which J. B. McClary is president, plans the expenditure of about \$500,000 in the building of by-product coke ovens near Bessemer and in other betterments not specified.

George H. Little, Tuscaloosa, Ala., heads a movement for the location of a benzol plant at Holt, Ala., adjacent to the furnace and by-product plant of the Central Iron & Coal Company.

The Jackson Lumber Company, Lockhart, Ala., will build a 40-ton storage and refrigerating plant.

J. H. Arnold & Co., Attalla, Ala., contemplate the building of a cotton compress at a cost of \$25,000.

The Ellis Ice & Coal Company, Augusta, Ga., will increase the capacity of its ice plant from 24 to 50 tons per day, expending about \$25,000.

The Harper Lumber Company, Willacoochee, Ga., will build a planing mill with a daily capacity of 12,000 ft. O. N. Harper is manager.

The Southern Power Company, Charlotte, N. C., will erect a power plant at Fishing Creek, near Great Falls, S. C., for the generation of 30,000 hp.

Frank H. Phillips, Cleveland, Tenn., has secured a site near Chattanooga, on which he plans to build a plant for the manufacture of core wood fiber for cast-iron pipe.

The Thomasville Chair Company, Thomasville, N. C., will erect an addition, four stories and basement, to its plant.

The City Council, Cary, N. C., has authorized an issue of \$20,000 of bonds for the municipal electric light plant.

J. L. White, Sylacauga, Ala., B. J. White and T. L. Craddock, Jackson's Gap, Ala., will establish a sash, door and blind factory at Alexander City, Ala.

The plant of the Mobile Brewing Company, Mobile, Ala., will be changed to an ice factory of 125 tons capacity. A. S. Lyons is president.

B. F. Roberts will construct a waterworks system at Notasulga, Ala., at a cost of \$13,000. E. B. McKay is engineer.

Phenix City, Ala., has voted \$16,000 of bonds for a waterworks system. Ashby Floyd is mayor.

Henry Smith, Gurley, Ala., will rebuild his burned electric lighting plant at a cost of \$3000.

The Coweta Mfg. Company, Newnan, Ga., has been incorporated by C. D. Manley, G. M. Jones, and others, with a capital stock of \$25,000, to manufacture farm implements, etc.

The W. Newell Smith Automobile Company, Union, S. C., suffered a loss of \$8000 by fire which partly destroyed its garage and equipment. It will re-establish its business in Greenville, S. C.

The Central South

LOUISVILLE, KY., April 26, 1915.

Business conditions in the South are improving steadily. Rises in cotton values and heavy sales of the staple have brought a return of confidence and increased the money in circulation. As a result collections are improving, business in all lines is picking up, and machinery manufacturers are finding prospects more encouraging than for some time. Reports for the past week do not show that as much actual buying has been done as in the week previous; but prospects continue good, and several large industrial projects are being formulated which will take a good deal of equipment. The boiler trade is picking up somewhat, and the demand for electric motors is also showing strength. Most lines of special equipment are in only fair demand.

The Fidelity & Columbia Trust Company, executor of the Ewald Iron Company, Louisville, has been authorized to sell June 2 at public auction 2955 shares of stock of the company at the minimum price of \$214.17. This is a sequel to a private sale of the stock to R. Baylor Hickman and others, the sale having been contested on the ground that not enough was realized. The company operates a rolling mill.

The Louisville Steel & Iron Company, which has been in process of reorganization by George H. Holzburg and others, is reported to be about ready to begin operations in the old plant of the Louisville Bolt & Iron Works. It will be equipped for manufacturing steel sheets.

The Continental Coal Corporation, Pineville, Ky., is in the market for a second-hand vertical fire-tube boiler of 50 hp. capacity and 100 lb. pressure, and two 150-hp. return tubular boilers, 150 lb. pressure, equipped with stacks and fittings. L. E. Yoder is chief engineer.

R. A. Greenwell, New Haven, Ky., is installing an electric light plant.

Walter Owsley, Hustonville, Ky., is reported to have purchased the local electric light plant, and to have plans for remodeling it. A 25-hp. engine will be installed and other improvements made.

G. M. Cottingham's blacksmith and machine shop, Dixie, Ky., was burned recently with \$3000 loss.

The Centreville Ice Company, Centreville, Tenn., is being organized, and will replace the plant burned several months ago.

J. W. Kyker, Newport, Tenn., will purchase a gasoline engine for the operation of special machinery. Electric motors will be installed later.

The Hooper Limestone Company, Chattanooga, Tenn., is planning the enlargement of its plant, and will need additional stone-crushing and conveying equipment.

Memphis, Tenn., has voted \$1,500,000 for building or buying a municipal electric light plant. The plant of the Memphis Light & Power Company may be purchased. J. H. Weatherford is city engineer.

The Southern Cotton Picker Company, Memphis, Tenn., has been incorporated with a \$30,000 capital stock, to manufacture a mechanical cotton picker. George Pryor, T. E. Johnston, Will Dockery, and others, are stockholders. The company is already making contracts for material.

W. J. and J. F. Rushton, Columbia, Tenn., will build a 30-ton ice factory at an estimated cost of \$50,000.

Bids will be received at the office of the mayor, Dresden, Tenn., until May 1, on the following equipment: One 80-hp. boiler, one 50-kw. direct-connected engine and generator, with switchboard, etc.; one 500,000-gal. compound water pump.

Two additional boilers will be installed at the filtration

plant of Knoxville, Tenn. They will be 100 and 55 hp, respectively. George P. McTeer is in charge.

W. J. Weinman, Nicholasville, Ky., is planning the development of a barytes property.

Elias Phillips, Heidelberg, Ky., is a new buyer of power plant and electrical supplies, having recently installed a street lighting system.

The Bell-Dowlen Mills Company, Springfield, Tenn., will establish a grain elevator and flour mill. The company, which is capitalized at \$25,000, was incorporated by C. A. Bell, Otto Dowlen, and others.

The Pittsburgh Power Company, Pittsburgh, Pa., plans to establish a waterpower plant on Chucky River, near Braemar, Tenn. It has an office at Elizabethton, Tenn.

The American Zinc Company of Tennessee, which is operating at Mascot, Tenn, near Knoxville, has begun the construction of an addition to its concentration mill to cost \$75,000. H. S. Kimball is president.

St. Louis

St. Louis, Mo., April 26, 1915.

The machine-tool business continues rather slow. The local market has not been affected much by the demand for tools utilized in the manufacture of war munitions except, perhaps, in the electrical motor division for power purposes. Banking conditions continue rather easy and that is regarded as a ground for hope that improvement in business will come with the development of assurance of safety of investment. In this respect, apparently, an excess of caution has compelled a slow recovery. Collections continue satisfactory on the whole. Second-hand tools are not active.

The Sieber Products Mfg. Company, St. Louis, Mo., has been incorporated with a capital stock of \$30,000 by H. L. Gardner, Breckinridge Long, Charles, Edward S. and Harry M. Sieber, and will manufacture loose-leaf binders, etc.

The Standard Pencil Company, St. Louis, Mo., has been incorporated with a capital stock of \$25,000 by W. C. Grant, M. S. Weeks, H. W. Brewer, L. L. Leonard and Verne M. Gould, and will manufacture office supplies.

The Cast Steel Locomotive Ashpan Company, St. Louis, Mo., has been incorporated with a capital stock of \$40,000 by H. M. Pfleger, Arthur T. Morey and Fred W. Dieckmann.

The Farmers' Lumber Company, Altamont, Mo., has been incorporated with a capital stock of \$18,000 by C. T. Lindsey, E. G. Brown and Arthur Smith.

The Heer-Andres Investment Company, Springfield, Mo., will equip an electric generation plant to cost about \$18,000.

The Twinal Silo Company, Kansas City, Mo., has been incorporated with a capital stock of \$12,000 by J. J. Holmes, Louis Hector and S. A. H. Handy, to manufacture silos.

Morris M. Cohn, Little Rock, Ark., has plans for the equipment of an automobile repair plant, and is in the market for equipment.

A car repair plant is reported to have been decided upon for the Rock Island system at Biddle, Ark. C. A. Morse, chief engineer, La Salle Street Station, Chicago, should be addressed.

The Gibbs & Austin Company Hot Springs, Ark., has been incorporated with a capital stock of \$12,000 by Ira R. Gibbs, R. B. Austin, J. P. Blackman, and others, to manufacture staves.

The Little Rock Handle Company Little Rock, Ark., will rebuild its plant, recently burned, and is in the market for about \$5000 worth of wood-working machinery.

The plant of the Smith-McGee Lumber Company, Eudora, Ark., which has been burned with a loss of about \$15,000 on equipment, will be replaced.

The Hugo Ice & Light Company, Hugo, Okla., will install one 500-kw. turbine-driven generating unit, including condenser and auxiliaries and a 400-hp. water-tube boiler.

The Corken-Hooton Machinery Company, Oklahoma City, Okla., has been incorporated with a capital stock of \$16,000 by O. A. Corken, W. L. Hutcheson and C. A. Hooton, to manufacture machinery.

The Luster Mfg. Company, Okmulgee, Okla., has been incorporated with a capital stock of \$12,000 by M. C. Luster, J. F. A. Deck, J. R. Ashley, A. R. Bradshaw, and others, to manufacture a patented harrow.

The Oklahoma Iron Works, Tulsa, Okla., will increase its plant, adding a building.

The Scientific Silo & Mfg. Company, Oklahoma City, Okla., has been incorporated with a capital stock of \$10,000 by W. C. Terry, T. M. Latham and Philo S. Harris, and will equip to manufacture silos.

The Southwestern Utilities Company, Blytheville, Ark., has increased its capital stock from \$425,000 to \$800,000 and will increase the capacity of its plant.

The Coal & Gas Belt Electric Company, Huntington, Ark., has increased its capital stock from \$50,000 to \$75,000.

The Prairie Grove Electric Company, Prairie Grove, Ark., has been incorporated with a capital stock of \$16,000 by J. T. Carl, S. R. Wilson and W. R. Dodson.

J. J. Culbertson, Tulsa, Okla., will equip a garage and motor repairing plant in a building which he is erecting.

The city of Drumright, Okla., will expend about \$35,000 on a waterworks plant. The mayor is in charge.

The Gas Crude Oil Burner, Muskogee, Okla., has been incorporated with a capital stock of \$11,500 by M. H. Stueve, H. K. Herbert, and others.

The Carr Safety Appliance Company, Oklahoma City, Okla., will equip to manufacture automatic gas cut-off, safety stop for steam engines, automatic knob lock control, and similar devices. S. C. Carr is president.

Garages and automobile repair plants are to be equipped at Sapulpa, Okla., by the Sapulpa Auto Company and the Producers' Garage Company. Charles W. Bliss, Tulsa, is interested in the former and W. P. Root in the latter.

The Globe Oil & Refining Company, McComb, Miss., will establish a distributing station with tanks, pumps, etc.

The Tylertown Box & Mfg. Company, Tylertown, Miss., has been organized by W. A. Boyd, J. C. Luter, and others, and will equip a wood-working plant.

The plant of the Gulf Compress Company, Tupelo, Miss., has been burned with a total loss of \$75,000. The equipment will be replaced at once.

W. A. Nabors and Fred Cowden, Mansfield, La., and others will equip a lumber plant, requiring about \$15,000 of machinery.

Durand Brothers, New Orleans, La., have plans to establish a sheet metal factory and are reported in the market for machinery.

The Linde Air Products Company, Forty-second Street Building, New York City, has purchased a factory site on Forest Park boulevard, between Sarah street and Boyle avenue, St. Louis, Mo., and the work of erecting the buildings will be started as soon as plans can be drawn and contracts awarded.

Texas

AUSTIN, TEXAS, April 25, 1915.

One of the features of the machinery trade in Texas is the increased demand for flourmill and grain elevator equipment. This demand is due to the bright prospects for an unusually large wheat crop. Oil operations in the Thrall field continue to increase and a great deal of machinery and other equipment for drilling wells are being sold. Splendid rains fell during the week in nearly every part of the State, enhancing the already promising crop prospects.

John A. Pool, Sr., Marfa, will construct a dam and install an irrigation pumping plant for irrigating about 1000 acres of land.

The Cleveland Mfg. Company, Cleveland, has been organized with a capital stock of \$6604.

E. E. Hartshorne, Carlsbad, N. M., will install an irrigation pumping plant on the Pecos River.

J. A. Gore and L. G. Lilly, Alamogordo, N. M., plan to install an irrigation pumping plant.

The El Paso Construction, Realty & Tile Company, El Paso, will build a temporary plant for the manufacture of roofing tile. It plans to erect a large permanent plant later on. Benjamin Franklin is manager.

The Nelson Morris Packing Company, Chicago, Ill., has purchased a site at Dallas for a branch establishment to cost about \$75,000.

The oil mixing plant which the Gulf Refining Company is erecting at Lynchburg will cost about \$750,000. It is being built on the unit system so that it can be enlarged from time to time.

R. C. Malone, Lubbock, will construct a 4-stand gin with cleaner and boiler attached.

The Cumby Electric Light Company, Cumby, will rebuild its powerhouse, which was destroyed by fire.

The Texas & Pacific Railroad Company will build an addition to its shops at Marshall. An acetylene gas plant will also be installed.

E. E. Dickerson, Ft. Worth, and associates, will build a plant for manufacturing a patented cotton-cleaning machine. The plant will cost about \$40,000.

The Transcontinental Compress Company, Paris, will rebuild its compress at Hugo, Okla., which was recently destroyed by fire.

The Texas Southern Electric Company will build a cold storage plant at Victoria to cost about \$8000.

The Harris-Irby Cotton Company will build a cotton gin at Childress to cost about \$8000.

McIntyre Brothers, Jefferson, plan to build a grain elevator of 100,000 bu. capacity.

The Producers Refining Company is being organized to build a 10,000-bbl. oil refinery at Gainesville to cost \$600,000. The promoters are F. H. Thwing, Kansas City, Mo.; H. M. Evans, Pasadena, Cal.; Thomas H. Smith, Denver, Colo., and George A. Todd, Ponca City, Okla.

W. K. Morrow, Houston, will build a ricemill at Stuttgart, Ark., of 800-bbl. daily capacity.

The Pacific Northwest

SEATTLE, WASH., April 20, 1915.

Activities of the Government in railroad building in Alaska are being felt in Seattle and other Northwest ports. Innumerable projects in contemplation have been held up awaiting this action, and now that the railroad is assured, promoters are busily engaged in preparing plans and securing suitable sites for manufacturing industries. A large shipment of rails has already been sent from Seattle, to be used in the railroad construction. The importance of Seattle in the matter of supplying the warring nations with necessities is shown by a large shipment of war automobiles and machinery to Russia through this port. Mining and dredging operations continue unusually active for this time of the year, and a large number of inquiries and possible orders are on hand with local machinery men. The Alaska whaling season, one of Seattle's large sources of income, has started in full swing. The last week has kept Seattle marine men busy outfitting and supplying whalers for their long season.

The Chamber of Commerce, Bellingham, Wash., has been advised by one of the largest window glass manufacturing concerns in the East that, if reports of its representative in Bellingham are favorable, a plant employing 450 men will be constructed in that city. Investigations as to site, coal situation, etc., are now being conducted.

The plant of the Washington Company, Aberdeen, Wash., manufacturer of wooden toys and wooden novelties, recently opened for business. It will eventually employ 150 men. W. B. Crammatte is president.

The Bremerton Machine Works, Bremerton, Wash., has been sold to W. O. Boulette, who will move it to a new location and will make some improvements.

The Western Iron & Wire Works, Tacoma, Wash., has been incorporated by B. E. Paul, Lee Buettner and Frank Buettner.

The incorporation of the H. H. Edmonds Lumber Company, Klamath Falls, Ore., has been announced, with H. H. Edmonds as president. The company owns approximately 20,000,000 ft. of white pine. A mill site has already been selected and part of the machinery is on the ground. The mill will have a capacity of 35,000 to 50,000 ft. daily.

The machine works of Bert Johnson, Port Orchard, Wash., has been taken over by J. I. Kenney, who will make extensions to it. Equipment will be added from time to time and new buildings erected, until a complete plant to repair the small steamers is acquired.

A planing mill will be established in Lakeview, Ore., by James Young, of that city.

H. A. Jensen, M. A. Thoresen, A. A. Sork, C. R. Miller and Peter Rorvik have formed a company and will install a water system and pumping plant in Circle, Mont.

The Bannker Box Company, Edmonds, Wash., has been incorporated for \$150,000 by James J. McCafferty, J. A. Gass, M. J. Costello, to manufacture woodenware. It will build a factory.

The Everett Timber Company, Everett, Wash., will begin work on logging about 400,000,000 ft. of timber on the Tulalip Reservation.

The Hell Gate Canyon & Coquille Power Company, Grants Pass, Ore., recently filed articles of incorporation with a capital stock of \$1,000,000, to build a power plant to provide power for city, irrigation and other purposes. George E. Sanders, George W. Sorenson, Grants Pass, and Wharton Plummer, Chicago, are the incorporators.

John Rustgard, Juneau, Alaska, is president of a company which will install a light and power plant at Juneau to supply that city and surrounding territory.

Owing to an explosion in the two large boilers of the power plant of the Hammond Mill Company, Astoria, Ore., wrecking the engine room, the city of Astoria is without

light and power and all manufacturing plants, elevators and dredging operations are stopped. Immediate steps will be taken to rebuild.

San Francisco

SAN FRANCISCO, CAL., April 20, 1915.

Machine-tool merchants regard conditions as far from satisfactory, although some report a very slight improvement from week to week. A great many inquiries are received for lists which would be attractive if substantial payments could be had; but in most cases the terms asked are not acceptable to dealers. While railroads and other large buyers are entirely out of the market, single tools for established shops are in greater demand, and the small garage and repair shop trade shows a seasonable improvement. Mill and logging machinery show a seasonable revival, on a much smaller scale than usual. A good many small orders are appearing for creamery and refrigerating equipment, and for small power units and mechanical equipment for country use, as well as for boilers and cannery machinery. The demand for road machinery is increasing; but sales in other lines of equipment for heavy construction have thus far been light.

Norman B. Livermore & Co., San Francisco, have secured the agency for the line of crushers, mining machinery, etc., made by the Chalmers & Williams Company, Chicago, Ill.

Brown & Sons, Cottonwood, Cal., have leased a flour mill and are putting in a lot of new machinery.

The Dairymen's Associated Condensed Milk Company, recently organized at Modesto, Cal., is preparing to build a milk condensing plant at a cost of \$75,000.

The Western States Gas & Electric Company, Placerville, Cal., is preparing to install a new generator in its power house.

The De Laitte Gas Machine Company, San Francisco, has been incorporated with a capital of \$300,000 by W. R. Broomfield, A. A. Rosenshine and W. P. Johnson.

The Humboldt Transit Company, Eureka, Cal., has purchased a site for a new machine and wood-working shop.

The Sound Construction Company, Seattle, Wash., has the contract for the construction of the new Rainier Brewery on Bryant street, San Francisco, including the removal and installation of the machinery now in the plant at Seattle.

The San Francisco board of public works is taking bids on a lot of sawmill machinery to be used on the Hetch Hetchy water project.

Two box factories, one at Bray and one at Castella, Cal., were recently burned, the loss in each case amounting to about \$35,000. Complete new outfits will be required for both plants.

Los Angeles, Cal., has voted \$6,500,000 of bonds for the construction of a municipal electric light and power plant.

Mayor A. G. Fell, of Ogden, Utah, announces that \$150,000 is soon to be spent on the improvement of the Ogden city waterworks.

Western Canada

WINNIPEG, MAN., April 24, 1915.

Although not much actual increase is found in the local machinery business, prospects have improved a little since last review. In several industrial lines a better tone than previously is noted, and it is confidently expected that business in the summer will be fairly good. A few announcements of new manufacturing plants are also being made.

The lumber industry in British Columbia shows a slight renewal of activity, and several hundred men have been put to work in mills and camps the past week. Sawmills and logging camps are preparing to open for the season. Information is given out by the vice-president of the Lumbermen's National Bank, Portland, that an inquiry has been received from the French Government for bids on 500,000,000 ft. of lumber, which, in all likelihood, will be supplied by British Columbia and Puget Sound mills.

Kamloops, B. C., is having plans prepared by the DuCane-Dutcher Company, 470 Granville street, Vancouver, B. C., for extensions to its electric light plant at an estimated cost of \$50,000. J. J. Carment is town clerk.

Richmond, B. C., contemplates extensions to its waterworks system at a cost of about \$40,000. G. S. Willson is clerk.

Ft. William, Ont., is making extensions to its waterworks system at a cost of about \$65,000.

W. Allen and F. King, Bellingham, Wash., are making plans for a shingle mill at West Vancouver, B. C.

The International Hardwood Company, of which S. E. McCallum, Victoria, B. C., is a prominent stockholder, con-

templates building a mill for re-sawing timber for the manufacture of furniture.

The Canada West Grain Company, Ltd., Melfort, Sask., is preparing to erect several grain elevators in that province, each with a capacity of 30,000 bu.

J. S. Hughes, Mill Village, N. S., has concluded negotiations with the industrial sites committee of Selkirk, Manitoba, for a plot upon which to erect a pulp mill at an estimated cost of \$150,000.

The Dwyer Grain Company, Ltd., Ft. William, Ont., has let a contract to D. A. Gordon, of that city, for an annex of 150,000 bu. capacity to its elevator.

Eastern Canada

TORONTO, ONT., April 26, 1915.

Business in Canada continues to improve, and aside altogether from war orders conditions are gradually becoming more normal with the various manufacturing industries. All over the country crop conditions are favorable and, with a more than usually early spring farming operations are well advanced. Even building operations are assuming more life, which has in turn led to the starting up of many brick-making plants.

The Dominion Bridge Company, Ltd., Montreal, has been authorized to manufacture shells and ammunition and to roll and draw metals.

The board of control, Toronto, will receive tenders up to May 4 for the installation of water-tube boilers at the main pumping station, and up to May 11 for a sludge pump and motor. Mayor T. L. Church is chairman of the board.

The Hughes Electric Heating Company, 585-595 Yonge street, Toronto, is to manufacture electric stoves.

The Toronto Hydroelectric Power Commission, 226 Yonge street, Toronto, is to erect a transformer station on Sterling road at a cost of \$7000.

A three-story machine shop is to be erected at 43 Davis avenue, Toronto, by J. A. Orum.

The foundry of the McKinnon Dash & Metal Works, St. Catharines, Ont., was damaged by fire on April 18.

William Pedwell's sawmill at Owen Sound, Ont., was destroyed by fire on April 17, with a loss of \$10,000.

The Department of Railways and Canals, Ottawa, will receive tenders up to May 5 for lock machinery and fittings, including cylindrical valves, for the Trent Canal. J. W. Pugley is secretary.

The Sarnia Metal Products Company, Ltd., Sarnia, Ont., has been incorporated with a capital stock of \$100,000 by Lloyd Lott, A. M. Lott, John Garroch and A. I. McKinley.

The Vanophone Company, Ltd., Toronto, has been incorporated with capital stock of \$200,000 to manufacture talking machines, etc. Joseph P. Walsh, D. B. Coleman, A. J. Kiely and Alexander J. Donnelly are the incorporators.

The American Nitrogen Company, Ltd., Montreal, has been incorporated with a capital stock of \$4,000,000 to manufacture chemicals, explosives, etc. The incorporators are George A. Campbell, Floyd Langford, Winthrop Brainard, and George A. Staples, all of Montreal, and Andrew R. McMaster, Westmount, Que.

The Diebel Furniture Company, Ltd., Stratford, Ont., has been incorporated with a capital stock of \$50,000 to manufacture furniture and builders' and contractors' supplies. Charles Diebel, Douglas E. Weir and William Ruttie, all of Hanover, Ont., are the incorporators.

The Franklin Steel Works, Ltd., Hamilton, Ont., has been incorporated with a capital stock of \$40,000 to manufacture toe calks. William Lees, J. M. Telford, Thomas Hobson, H. S. Lees and R. P. McBride are the incorporators.

William R. Perrin, Ltd., Toronto, has been incorporated with a capital stock of \$40,000. W. R. Perrin, G. V. Holmes, W. H. Irving, H. H. Davis and J. R. Rumball, to manufacture packing house machinery, hydraulic presses, etc.

The Dominion Sheet Metal Company, Ltd., Hamilton, Ont., has been incorporated with a capital stock of \$300,000 for the purpose of manufacturing steel metals, and rolling, tinning, galvanizing, coating and plating metals and other substances. James H. Oldham and William James Beaton, both of Toronto, are provisional directors.

Marshall & Sime, Ltd., Port Arthur, Ont., will manufacture plumbing supplies, with a capital stock of \$40,000. John Marshall, W. B. Sime and W. F. Langworthy are provisional directors.

The Reid Appliance Company, Ltd., Windsor, Ont., has been incorporated with a capital stock of \$50,000 to manufacture automobiles, aeroplanes, motor boats, gas engines, etc. T. B. Mothersill, A. R. Bartlet, W. G. Bartlet and G. A. Urquhart are the incorporators.

The Standard Planing Mills Company, Ltd., North Bay, Ont., has been incorporated with a capital stock of \$40,000 to manufacture lumber. C. W. Wilkinson, S. L. Mulholland, H. G. McDermid, all of Toronto, and J. H. Douglas and J. M. McNamara, North Bay, are the incorporators.

The Kerosene Burning Carbureter Company, Ltd., Berlin, Ont., has been incorporated with a capital stock of \$100,000. John H. Chambers, Winnipeg; Charles H. Bennett, Detroit; J. D. C. Forsyth, D. S. Sheldon and Otto F. Dannecker, all of Berlin, to manufacture machinery, automobiles, motor boats, etc.

The Goderich Salt Company, Goderich, Ont., proposes to erect a new plant. J. Ransford is manager.

George McKnight & Co., Ltd., Montreal, has been incorporated as a general construction and engineering company, with a capital stock of \$40,000. Louis A. David, Segfried H. R. Brush, Amedee Blanchard, John L. Hutcheon and Edward C. Baker, all of Montreal, are the incorporators.

The William Snider Milling Company, Ltd., Waterloo, Ont., has been incorporated with a capital stock of \$50,000 to manufacture flour, etc., by Frederick W. Snider and James Clayton Haight, Waterloo, and Willard Henry, Toronto.

A. H. Wagstaff, 334 Greenwood avenue, Toronto, is to erect a brick drier and machine shed to replace that recently destroyed by fire.

The Meades Upholstering Company, Ltd., Hanover, Ont., has been incorporated to manufacture furniture with a capital stock of \$50,000. Walter Meades, George A. Rozel, Archibald B. Taylor, Ralph Brunt, Joseph Jagelewski and John Mills, all of Hanover, are the incorporators.

Government Purchases

WASHINGTON, D. C., April 26, 1915.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 11: schedule 8206, two geared head lathes and one milling machine with oil pump attachment, all for Washington; schedule 8207, one 3-ton locomotive crane for Newport; schedule 8209, one geared trimming press, and schedule 8211, one rotary shear, complete, with motor and circular cutting extension, both for Norfolk; schedule 8212, one stake riveter and punching machine for Boston.

The 250-ton floating cranes, Ajax and Hercules, are to be fitted with steam-driven pumps for emptying salvaged vessels. Most of the pumping equipment is in stock, but the following machinery will have to be purchased: Two 125-hp., one 85-hp., and two 40-hp. motors.

Belgian Machinery Agencies After the War

Edmond Isbecque, who was driven from Antwerp, Belgium, by the fall of that city, has recently been in the United States studying American machinery. He has closed contracts to represent in Belgium and its colonies the Hydraulic Press Mfg. Company, Mt. Gilead, Ohio; the Jeffrey Mfg. Company, Columbus, Ohio; the American Tool Works Company, Cincinnati, and the Acme Machine Tool Company, Cincinnati. His entire business in Belgium has been abandoned, although the headquarters in Antwerp, where formerly 50 salesmen and clerks were employed, and the branch office at Brussels are uninjured. Mr. Isbecque will resume his business after the war is ended with the aid of English capital. He has already established an account with a New York bank, through which American purchases will be paid.

In an interview with F. D. McMillin, general manager of the Hydraulic Press Mfg. Company, reported by the latter in a Mt. Gilead, Ohio, paper, Mr. Isbecque expressed the opinion that American manufacturers will profit largely in the readjustment of commercial enterprises within the war zone. He declared that for a long time buyers in England, Russia, France and Belgium would turn to this country for machinery.

A bill to regulate the sale of road-building machinery has been introduced into the Iowa Legislature. It provides that every manufacturer of such equipment shall file a description of such articles with the state highway commissioner and "shall state the price at which such article shall be sold." A license fee is charged and a bond of \$5000 is required to insure that, if the selling price is lowered below that specified, all subsequent sales for that year shall be made at the new low figure.

Trade Publications

Forcing Presses.—Watson-Stillman Company, 190 Fulton street, New York City. Catalogue No. 92, superseding catalogue No. 70 and a portion of No. 82. Size, 6 x 9 in.; pages, 128. Pertains to a line of hydraulic forcing and miscellaneous presses. The presses covered include wheel, crank pin, armature and broaching presses, together with several of the reversed cylinder type for miscellaneous forcing. In the case of the wheel and crank pin presses, an extended description of their construction is given, followed by engravings of the several types, with condensed specification tables, a pair of pages, as a rule, being devoted to each. A drawing showing the method of using special fittings for the crank pin press is presented, together with illustrations of the fittings and dimension tables of the rear beams. For the most part, each of the other presses is given a single page, with an engraving, description and brief specification table. Mention is made of presses for baling sheet metal scrap and a number of special presses for forcing bolts into or out of heavy shaft couplings and making briquettes, smokeless powder, crayon pencils, etc., are shown. Installation diagrams are presented, and a list of the other publications of the company is included.

Cooling Air and Water.—Spray Engineering Company, 93 Federal street, Boston, Mass. Bulletins Nos. 101 and 151. The first describes the use of sprays for cooling water for condensers, transformers and water jackets in which the hot water is cooled by spraying it into the air, so that when it falls into the basin the high temperature is reduced sufficiently to permit of its being used over again. A number of illustrations of installations of the system are included. The second bulletin gives a description of the application of the spray system to the washing and cooling of air for steam turbine generators. Illustrations of the nozzle and the atomizing screen used with it are presented together with views showing the spray from nozzles where the screen is and is not used. An elevation and plan of an air washer layout for a turbo-generator is presented together with a table of the temperature to which air can be cooled by the washer.

Electric Welding Machine.—Welding Materials Company, Inc., 114 Liberty street, New York City. Bulletin No. 1915 A. Relates to an arc welding machine in which a variable-voltage generator is used to supply the current. In addition to illustrating and describing the apparatus and showing work done by the electric welding machine the use of the carbo-graphite and metal electrodes is discussed.

Alloy Steel Gears.—Kennedy-Stroh Corporation, Pittsburgh, Pa. Folder. Devoted to gears made by the Stroh process which consists of the application of a special alloy to the surfaces of carbon steel castings that are subject to severe service. Illustrations of gears that have been cast by this process for cement and rolling mills and general service are presented. Mention is also made of a line of castings that can be supplied in different metals.

Reversible Ratchet Wrenches.—Lowell Wrench Company, Worcester, Mass. Catalogue. Describes and illustrates several types of reversible ratchet wrenches, including lag-screw and multiplex socket wrenches and ratchet drills.

Plumbers' and Machinists' Tools.—Erie Tool Works, Erie, Pa. Catalogue No. 7. Illustrates a line of vises, including machinists' pipe and malleable iron pipe types, stocks and pipe dies, pipe cutters, wrenches, pipe and taper reamers and pipe taps. A separate page is devoted to each line, an illustration and brief dimension tables supplementing the description.

Pipe, Tubing and Couplings.—Davidson Pipe & Supply Company, N. S. Pittsburgh, Pa. Catalogue. Covers a line of black and galvanized wrought-iron and steel pipe, steel and iron casing for oil and water wells, well tubing, boiler tubes, couplings and wrought-iron nipples. An explanation of pipe-trade customs is included. Tables of dimensions and weights of the several lines are presented.

Power Plant Specialties.—Industrial Requirements Company, 41 South Third street, Philadelphia, Pa. Collection of folders. Describes and illustrates a line of power plant specialties, which includes a bomb calorimeter for determining the fuel value of coal, stemless pump valves, a steam trap and a steam separator. The advantages claimed for the valves, which are made without center posts, studs, webs or rubber disks, are a reduced cost of maintenance and the pumping of more water with the same steam consumption. The steam trap, which is made in six parts, possesses as its special features positive action and simple construction. Views showing the various parts of the trap and the way in which they are put together are presented together with a table of the principal dimensions and capacities. The steam separator is of the dome type, and a diagram is included showing the way in which moisture and condensation are separated from the

steam. Mention is also made of a vertical steam separator designed for location at the throttle of the engine to catch what condensation gathers in the pipe line between the boiler and the engine and an oil separator. Tables of the sizes that can be supplied are presented.

Grinding Wheels.—Pittsburgh Emery Wheel Company, Rochester, Pa. Pamphlet. Contains price lists for straight, cup, cylinder and special shape wheels, to take effect July 1. It is not designed to give the prices at which wheels shall be sold to the trade, but is an effort on the part of 21 manufacturers to correct the inconsistencies in the present standard lists in relation to the value of different sizes of wheels to each other and to the cost of manufacture. It also shows the relative values of wheels and gives the rules for figuring prices for wheels based upon such relative values.

Marine Machinery and Steel Boats.—Marine Iron Works, Claybourn and Southport avenues, Chicago, Ill. Catalogue No. 19 and folder. The first, which is of the standard 6 x 9-in. size, contains illustrations and extensive description of a line of marine machinery, including engines of all kinds, stern paddle-wheel machinery, cut-off valves, vertical and horizontal boilers, condensing apparatus, propeller wheels, cargo hoists, capstans, circulating and test pumps, searchlights, steering wheels, throttle valves, etc. It also discusses a plan of composite steel and wood "knock-down" construction of shallow water boats, thus allowing them to be shipped and reassembled without skilled labor. The folder takes up steel boats, both stern wheel and propeller types, which can be shipped in parts.

Oils, Greases and Lubricants.—A. W. Harris Oil Company, 326 South Water street, Providence, R. I. Folder and collection of loose leaf circulars. Describe a line of oils, greases and lubricants for all classes of machinery, automobiles, aeroplanes, motor boats, motor cycles and stationary engines. Oils for special uses as cylinder oils, gear and transmission oil, etc., are discussed.

Portable Air Compressors and Jackhammer Mountings.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletins Nos. 3015 and 4032. The first, a 32-page booklet, gives an exhaustive treatise on portable air compressing outfits for contractors, factories and mines employing air tools in connection with work of a temporary or semi-permanent nature. It is illustrated with photographs of the several types of machines in operation and details of their construction. The second bulletin covers a line of mountings for jackhammers used in flat boring where holding the drill would be tiring to the workman.

Risers and Subtreads.—Riser & Moulding Company, Thomas street and Stewart avenue, Brooklyn, N. Y. Folder. Calls attention to a line of risers and subtreads for use with wood, slate, marble or concrete. A sectional elevation showing a flight of stairs constructed with these risers and subtreads is included.

Motor Trucks.—Knickerbocker Motor Truck Mfg. Company, 151st street and River avenue, New York City. Catalogue. Takes up a line of commercial cars from 3½ to 5-ton capacity, showing the adaptability of different types of bodies by photographs and giving features of construction and mechanical parts in some detail. The easy accessibility of mechanical parts and quick removal of the power plant are given especial emphasis. Included is a table of general information concerning these trucks and the estimated cost of operation per mile.

Safety Cut-Out Hangers.—Thompson Electric Company, 5606 Euclid avenue, Cleveland, Ohio. Circular and folder. Describe the Thompson method of suspending arc lamps which has the advantage of easy access for cleaning. An illustration of the hanger is presented showing it disconnected and ready for lowering. *The Iron Age*, March 7, 1911, contained an illustrated description of the hanger.

Machine Vises.—Schuchardt & Schutte, 90 West street, New York City. Folder. Illustrates and explains the use of the S. & S. line of divided machine vises for holding work on planing, milling, shaping, drilling and slotting machine tables. The fact that these vises are divided allows them to work up to the full length of the machine table.

Pumps.—Red Jacket Mfg. Company, Davenport, Iowa. Catalogue No. 38. Describes a line of pumps that are made in a great variety of sizes and styles and the different parts that are used in connection with them, such as valves, cylinders, leathers, strainers, bushings, etc. In compiling the catalogue an effort has been made to give as complete information as possible about the several pumps and a table showing the proper sizes of pumps to be used for various depths of wells and particular local conditions is included. Tables of useful information and a discussion of pump troubles and their remedies are given. Instructions on the ordering of repair parts and illustrated lists for the different pumps are presented.



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